EFFECTIVENESS OF PIN TRICK METHOD ON PAIN DURING IM INJECTION AMONG PATIENTS IN THE OUT PATIENT DEPARTMENT AT KONGUNAD HOSPITAL, COIMBATORE.

BY

Reg.No: 301312852

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CERTIFICATE

Certified that this is the bonafide work of **Ms. GEETHA CHITRA.J** Final year M.Sc (Nursing) student of Kongunadu College of Nursing, Coimbatore, submitted in partial fulfillment of the Degree of Master of Science in Nursing to the Tamilnadu Dr.M.G.R. Medical University, Chennai under the Registration No: **301312852.**

College Seal:

Signature: …….

Prof. Mrs. K. PAPPATHI, M.Sc (N).,
PRINCIPAL,
KONGUNADU COLLEGE OF NURSING,
COIMBATORE.

EFFECTIVENESS OF PIN TRICK METHOD ON PAIN DURING IM INJECTION AMONG PATIENTS IN THE OUT PATIENT DEPARTMENTAT KONGUNAD HOSPITAL, COIMBATORE.

Approved by Dissertation Committee on: 21.1.2014

Signature of the Research Advisor: **…….**

Prof. P. LALITHA. M.Sc (N)., (PhD).,
Vice Principal,
Kongunadu College of Nursing,
Coimbatore.

Signature of the Clinical Speciality Guide: …….

Mrs. M. NIRMALA M.Sc (N).,
Professor,
Department of Medical Surgical Nursing,
Kongunadu College of Nursing,
Coimbatore.

Signature of the Medical Expert: **…….**

Dr.R.KARTHIKEYAN .M.S.,
General Surgeon,
Kongunad Hospital Pvt. Ltd.,
Coimbatore.

……. **…….**

Signature of the External Examiner with date

Signature of the Internal Examiner with date

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXURES

ABSTRACT

A study was conducted to evaluate the effectiveness of Pin-trick method on Pain during intramuscular injection among patients in the outpatient department at Kongunad hospitals, Coimbatore. A quantitative evaluative approach with quasi experimental post-test only control group design was used. Through Non-Probability Convenience Sampling Technique, 120 samples were selected, among them 60 samples from Outpatient department were assigned to experimental group and 60 samples from emergency department were assigned to control group. The conceptual frame work selected for this study was based on Von Bertanlanffy general system theory. Demographic variables were collected by using a Structured Interview schedule. In experimental group, investigator used pin-trick device during intra muscular injection and assessed the level of pain by using numerical pain intensity rating scale. In control group investigator followed regular IM injection without any intervention. The data gathered were analysed by descriptive and inferential statistical method. The findings revealed that in the experimental group the post -test mean, on level of pain among patient receiving intramuscular injection was 1.62±1.27 and in control group it was 4.63±1.16. The mean percentage of experimental group was 16.2 and control group was 46.3. The mean difference was 3.01. It revealed that in experimental group, samples had low level of pain than the control group. Unpaired 't' test value 9.75 was greater than the table value 2.35 at $p \leq 0.01$ level and it revealed the effectiveness of pin–trick method on Intramuscular injection on the level of pain among experimental group. Hence the hypothesis H_1 was retained. It was evident that pin-trick method was effective in reducing pain among patients receiving intramuscular injection in experimental group. In the experimental group there was a significant association found between age, marital status and BMI and their level of pain. Hence, the hypothesis H_2 was accepted for the above mentioned variables. Whereas all the other variables such as sex, religion, education, occupation, working status, body built, co-morbid illness, frequency of intra muscular injection, type of medication, site of intramuscular injection, position during intra muscular injection, and volume of medication were not associated. Hence, the hypothesis H_2 was rejected for the above mentioned variables. In control group, none of the variables were associated with the level of pain. Hence, the hypothesis H_2 was accepted. So Pin-trick method is one of the effective methods to reduce the level of pain during IM injection.

CHAPTER I
INTRODUCTION

"Pain is the primary reason for which people seek health care"

Over 200 years ago **Aristotle** described pain as a 'passions of the soul'. He emphasized that pain is not just a physical sensation by omitting from his list of the five senses (sight, hear, smell, taste and touch) the word pain comes from the Latin word '**POENA'** which means punishment or penalty. **International association for study of pain** (IASP) defined pain as an unpleasant, subjective, sensory and emotional experience associated with actual or potential tissue damage.

WHO defined pain as "an unpleasant sensory or emotional experience associated with actual or potential tissue damage or described in terms of such damage?"

Lewis Chintamani (2011) states that pain is a complex, multi-dimensional experience. For many people, it is a major problem that cause suffering and reduce quality of life. A thorough physiological and psychological dimension of the pain is important for effective assessment and management of patients with pain.

Nociception represents the neural process of encoding and processing noxious stimuli necessary, but not sufficient for pain. Pain results from the integration of the pain related signal into specific cortical areas of the brain associated with higher mental process and consciousness. In other words pain is the conscious experience that emerges from Nociception. Four processes that are involved in Nociception are transduction, transmission, perception and modulation.

The pain message is transmitted by the spinothalamic pathways to centres in the brain, where it is perceived. Pain sensation transmitted by the neospinothalamic pathway reaches the thalamus, and the pain sensation transmitted by the paleospinothalamic pathway reaches brainstem, hypothalamus and thalamus. These parts of the central nervous system contribute to the initial perception of the pain.

Gordon A. Irving (2011) states that pain is a universal experience. The **American Pain Society** labelled it as the fifth vital sign to emphasize the importance of assessing pain frequently and providing appropriate care. Pain is highly subjective. Pain is a complex and multi dimensional phenomenon. It comprises of five components such as affective, behavioural, cognitive, sensory and Physiological. Each dimension is implemented in the assessment and management to alleviate pain.

Karen.A. Sitorski (2004) states in the natural environment, pain serves as a mechanism to warn us about potential or physical harm. Thus pain in the body is a protective mechanism to prevent further tissue damage by providing the impetus to withdraw from the pain producing situation. The discomfort and distress associated with pain often last beyond the tissue damaging experience.

The Gate Control theory of pain, published by **Ronald Melzack and Patrick Wall** in Science in 1965, was formulated to provide a mechanism for coding the nociceptive component of cutaneous sensory input. The theory dealt explicitly with the apparent conflict in the 1960's between the paucity of sensory neurons that responded selectively to intense stimuli and the well-established

finding that stimulation of the small fibres in peripheral nerves is required for the stimulus to be described as painful. It incorporated recently discovered mechanisms of pre synaptic control of synaptic transmission from large and small sensory afferents, which was suggested to "gate" incoming information depending on the balance between these inputs. Other important features included the convergence of small and large sensory inputs on spinal neurons that transmitted the sensory information to the forebrain as well as the ability of descending control pathways to affect the biasing established by the gate.

Nellie (2004) states an intramuscular injection is the favourable route of administering medication where, fairly rapid-acting and long-lasting dosage of medication is required. Administration of intramuscular injection is the injection of medication into central area of specific muscle tissue that forms a deposit of medication. From the tissues through the blood vessels the injected medications are distributed via cardio vascular system. An intramuscular injection is the safest, easiest and best tolerated route of injection.

Pollilio and Kiley (2004) stated that the administration of intramuscular injection is a common nursing intervention in clinical practice and also the cause for iatrogenic pain. Patients are often afraid of receiving intramuscular injection because they perceive that it will be painful. The pain of intramuscular injections may be registered as the pain receptors in the skin or the pressure receptors in the muscle. Distraction or behaviour modification techniques that stimulate the skin or muscle may be useful to reduce needle related pain. It has been suggested that numbing the skin with ice or freezing sprays before intramuscular injection may reduce pain.

Hans Bell Halvey and Paice (2004) studied that different pharmacological management has been tried to manage pain. Nursing measures are significantly effective. Some of the non pharmacological nursing measures are cognitive behavioural strategies such as distraction, guided imagery, education, prayer and physical measures include heat, massage, bracing and assistive devices. These measures seem to be useful and effective in managing the pain.

Need for the Study

Pain is one of the most frequent and significant problem encountered by nurses during practice. Pain assessment and pain management are still poorly dealt by nurses. Inability to manage pain effectively has been attributed to failure to use the principles and tools of scientific inquiry but there is very little research done in this area of clinical decision making and management.

According to **WHO,** injections are the most frequently used medical procedures. Each year 16 billion injections are administered in developing and transitional countries. The vast majority, around 95% are given in curative care. Immunizations accounts for around 3 % of all injection. People residing in developing regions receive 1.5-11.3 injections per person per year. India contributes 25-30% of global injection load.

Zengerle Levy, (2006) quoted that more than 12 billion injections are administered each year worldwide. In India, a survey found that 96% of all injections given by health care providers were of antibiotics, vitamins and analgesics. 48% of patients mentioned needle injection as disturbing and 62% had fear about intramuscular injection. Needle phobia affects at least 10% of the total population and it also lead to avoidance of medical care. People do not come forward to any invasive procedures because of pain which leads to greater intensity

Sikorsti Donnam Barker (2004) states that newer method and their cognition of complementary pain management strategies have contributed to the improved ability to manage pain and to provide satisfactory pain reduction or relief. If this existing knowledge and resources were used to manage pain then 90% of people with pain would receive satisfactory reduction or relief. Barriers to adequate pain management may be relieved by health care professionals, including nurses, physicians and health care system.

Leslie H. Nicoll, E.S. Muskie, Amy Hesby (2002) studied that intramuscular injections (IM) are a common yet complex technique used to deliver medication deep into the large muscles of the body. More than 12 billion IM injections are administered annually throughout the world. However, it is not a benign procedure, and unsafe injection practices are estimated to have significant impacts on patient morbidity and mortality and result in millions of dollars in direct medical costs on an annual basis. Although there is significant research, spanning eight decades, on the procedure and techniques of administering medications by the IM route, instruction materials and clinician practice do not always reflect research-based practice. An integrative review of the literature has resulted in the development of a guideline for evidence-based practice of IM injections. Use of this guideline can assist the clinician to maximize the therapeutic effects of administered medication while minimizing or eliminating patient injury and discomfort associated with IM injections.

Stevens. B et. al., studied that in recent years there are significant advances in the field of pain management. It is not only reducing discomfort but also improves the quality of life. **American Pain Society** has developed policy

statements addressing the numerous therapeutic measures to minimize pain. One among them is the purposive pressure applied by using a round plastic device with multiple blunt pins at the injection site during intra muscular injection called the pin-trick.

Carlo L .Romano and Emanuela Cecca, (2011) conducted a comparative study on pinprick and pin-tricks, a new method to reduce pin-prick pain of intramuscular and subcutaneous injection. In that 212 patients participated, who received intramuscular and subcutaneous injection was randomly assigned to 2 groups. Each group had 106 patients in treated group and control group respectively. Treated group patients received injection by using an oval plastic disc which have multiple blunt pins and with 5mm hole in the centre through which the injection needle is inserted. In control group, an oval flat plastic disk, without pins was used. The post test pain was assessed by visual analogue scale. The result revealed that pain score for treated group was (5.16±1.37 vs. 1.90±1.27 when compared with control group was 2.01±0.77 vs. 0.32±0.51) and there was significant pain reduction in the treated group when compared with control group.

During the clinical experience the investigator had observed that all patients experienced pain and discomfort during Intramuscular injection. Since the IM injection has as associated, negative connotation of pain, may patients verbalized some fear and muscle contraction prior to receiving the injection. There are many devices which physiological stimulate the nerve endings, thereby reducing the pain. It is a Non-invasive procedure so no chance of getting infection. No need of privacy during intramuscular injection. It is easy to use and cost effective.

Statement of the Problem

A STUDY TO ASSESS THE EFFECTIVENESS OF PIN TRICK METHOD ON PAIN DURING IM INJECTION AMONG PATIENTS IN THE OUTPATIENT DEPARTMENT AT KONGUNAD HOSPITAL, COIMBATORE

Objectives

1. To assess the level of pain during intramuscular injection among patients in experimental and control group.
2. To evaluate the effectiveness of pin-trick method on level of pain among patients during intramuscular injection in experimental group.
3. To associate the level of pain among patients receiving intramuscular injection in experimental and control group with their selected demographic variables.

Operational Definition

Effectiveness

It refers to the significant difference in the level of pain after implementation of pin-trick method which is statistically evident.

Pin-trick method

It is the purposive pressure applied by using a round plastic device with multiple blunt pins at the injection site during intra muscular injection.

Pain

The unpleasant subjective sensation experienced by the patients during intramuscular injection and is measured by numerical pain rating scale (0-10).

IM (Intra muscular injection)

It is the administration of medication with syringe and needle deep into a large muscle of the body for prophylactic or curative purpose.

Assumptions

- The patients receiving intra muscular injection may experience pain.
- The staff nurses have a vital role in reducing the pain during intramuscular injection.
- The pin – trick method during intra muscular injection has therapeutic effect in reducing pain

Hypotheses

H_1: There is a significant difference between the mean post test scores of samples in experimental and control group.

H_2: There is a significant association between the level of pain and their selected demographic variables among experimental and control group.

Delimitation:

The study is limited to samples of age group below 18 years.

The study is limited to patients who are receiving intramuscular injection only.

The study is limited to the patients coming to out-patient department only.

Projected outcome:

The result of the study will prove whether the application of Pin trick method prior to intramuscular injection is effective in reducing the level of pain.

The findings of the study will help to promote patient's comfort.

The result will help the nurse to implement Pin trick method independently, to alleviate patient's pain perception during intra muscular injection.

Conceptual Framework

A Conceptual framework refers to frame work of prepositions for conducting research. Conceptual framework serves as a spring board for theory development as this is made up of concepts which are mental images of a phenomenon.

Polit and Hungler (1995) state that, conceptual framework is interrelated concept or abstractions that are assembled together in some rational scheme by virtue of their relevance to a common theme. It is a device that helps to stimulate research and extension of knowledge by providing both direction and impetus.

Conceptual framework selected for this study was based on **Ludwig Von Bertanlanffy (1972)** general System Theory. This theory mainly focuses on the discrete past and their relationship which makeup and describe the whole it defines the system, as a complex interaction which means that system consist of two or more converted elements which form an organized or unorganized whole and which interact with each other. In general system theory, the systems are composed of both structural and functional components that interact with in boundary, which filter the type and rate of exchange with the environment. A structure refers to the arrangements of the part at a given time whereas function is the process of continuous change in the system as matter, energy and information.

Ludwig Von Bertalanffy's general system theory focused on three areas.

- Input
- Throughput
- Output

Input:

It refers to demographic variables. All the system must receive varying type and amount of information from the environment or variables.

In the present study input is considered being the information related to variables. It includes age, sex, religion, education, marital status, occupation, type of work, body built, body mass index, presence of co-morbid illness, frequency of intra muscular injection, type of medication, site of the IM injection, size of the needle, position during IM injection and volume of medication injected.

Through put:

It refers to the process by which the system process input and release on "output". In the present study the through put-considering for processing the input. Throughput is considered being the intervention given to the experimental group and it is using pin-trick application during IM injection. Routine method of IM injection was administered to the control group.

Output:

It refers to the outcome of processed data that energy of material, which is transferred to the environment.

The output was asses the level of pain by numerical pain intensity rating scale (NPIRS) to both experimental and control group.

Summary:

This chapter dealt with introduction, need for study, statement of the problem, objectives, operational definition, assumptions, hypotheses and conceptual framework.

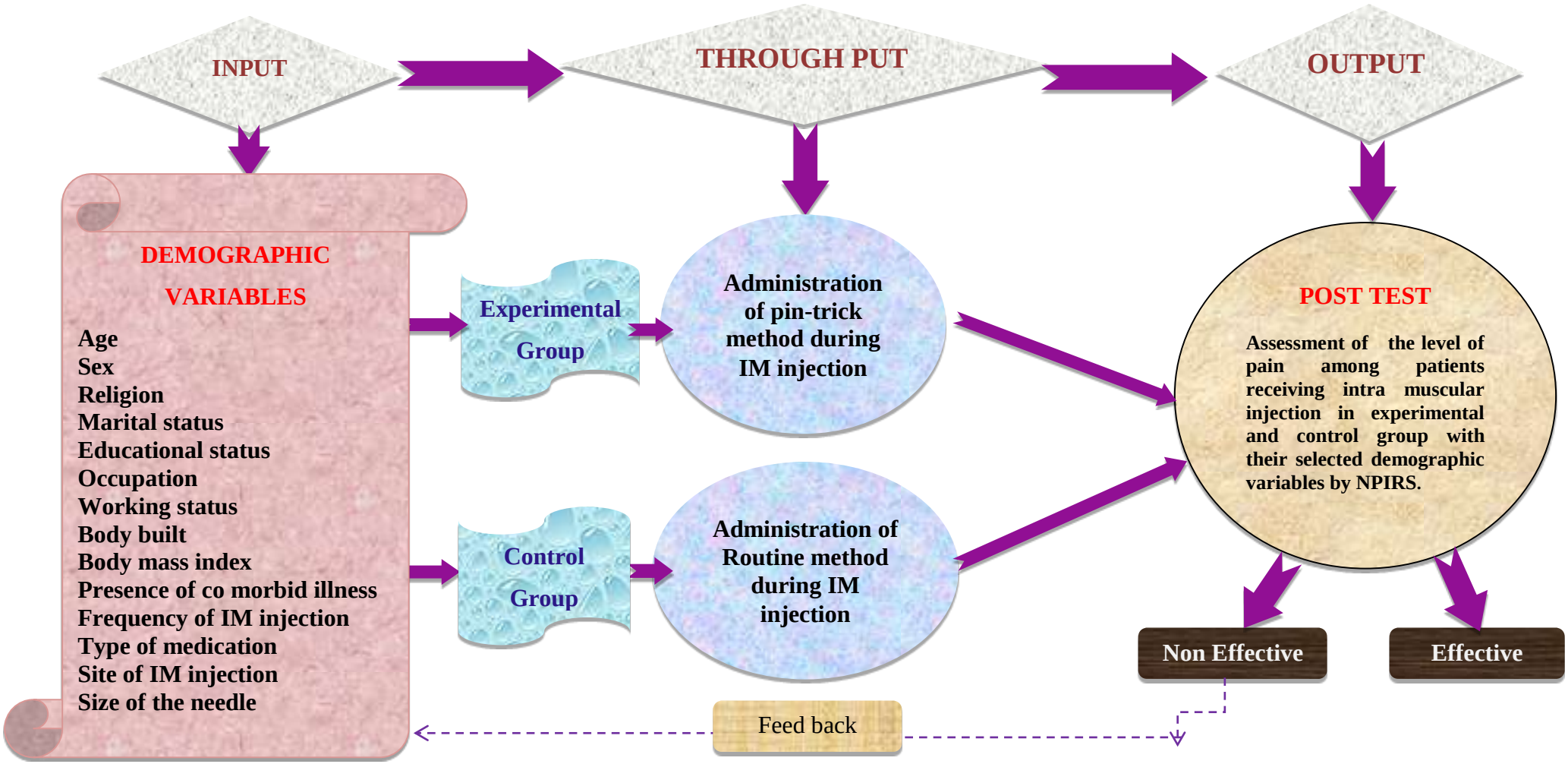

Fig. 1.1 Conceptual Frame Work: Modified Ludwig Von Bertalanffy's General System Theory (1972)

CHAPTER II

REVIEW OF LITERATURE

The desire of knowledge; like the unit of riches; Increases even with the acquisition of it!

Lawrence

The review of literature is a key step in research process. Review of literature refers to an extensive, exhaustive and systematic examination of publications relevant to the research project. The review of literature is defined as a broad, comprehensive, in depth, systematic and critical review of scholarly publications, unpublished scholarly print material, audiovisual materials and personal communications. A literature review is an account of the previous efforts and achievements of scholars and researchers on a phenomenon.

According to **Polit and Hungler** (**2002**), review of literature is a critical summary of research on a topic of interest generally prepared to put a research problem in context to identify gaps in prior studies to justify a new investigation.

This chapter has review of studies done, methodology adopted and conclusion obtained by other investigator which helps to study the problem in depth. The sources obtained are from textbooks, journals and internet searches.

The available literatures are organized in the following headings:-

1. **Literature related to pain perception during intra muscular injection**
2. **Literature related to non pharmacological pain management technique during intramuscular injection**
3. **Literature related to effectiveness of pin-trick method during intramuscular injection.**

1. Literature related to pain perception during intramuscular injection

Kara D, et. al., (2014) conducted a randomized controlled study in 2010 among 75 patients receiving diclofenac sodium intramuscularly at a university hospital in Zonguldak, Turkey. The primary outcome measure collected was pain intensity, measured on a visual analogue scale. Each subject received three injections by the same investigator using three different techniques. The three techniques were randomly allocated and the subjects were blinded to the injection technique being used. After each injection, another investigator, who had no prior knowledge of which injection technique was used assessed pain intensity using the visual analogue scale. Research findings demonstrated that the Z-track and internally rotated foot techniques significantly reduced pain intensity during intramuscular injection. Statistically significant differences in pain intensity were observed between the three injection techniques.

Ulkii Yapucu Guneş, Dilek Kara, Suer Ari, Onur Ceyhan (2012) conducted a study to examine the effect on intramuscular injection pain to the dorsogluteal and ventrogluteal sites and to investigate gender and body mass index differences in pain perception between the sites among 70 patients receiving at least two doses of diclofenac sodium intramuscularly in a state hospital in Bursa, Turkey. Two injections were administered to each patient with an interval of 24 hours by the same researcher using two injection sites. The injection sites were randomly allocated. After each injection, the pain felt by patients during the injection was immediately assessed using a visual analogue scale by another researcher. Numerical and percentage distribution of socio demographic data on patients' identification characteristics were calculated. The Wilcox on signed rank test was

used to explore determine the statistical differences in perceived pain intensity between the two injection sites. Differences in the mean pain intensity at the dorsogluteal and ventrogluteal sites by BMI and gender were analysed using the paired t test. The average pain score of patients after injections to the ventrogluteal site was 1.24±1.18, while that for injections to the dorsogluteal site was 1.89±1.49. The difference in average pain scores from injections administered to the two different sites was found to be statistically significant (p<0.05). The results supported the hypothesis that intramuscular injections of diclofenac sodium administered to the ventrogluteal site would feel less painful than those administered to the dorsogluteal site.

Francis Sahngun Nahm et. al., (2012) evaluated the influences of patient characteristics on pain perception due to intramuscular vaccine injection among 160 volunteers (65 males, 95 females). The injection of hepatitis B vaccine using a, 24G needle was performed as a uniform stimulus and the intensity of pain was measured immediately after the injection using a 100-mm visual analogue scale (VAS). The influences of patient characteristics on pain intensity were investigated. The average VAS score was 20.8 ± 17.1 (range 0 to 67) in males and 34.4 ± 19.7 (range 2 to 76) in females (P < 0.001). Gender appeared to be the only major factor that influenced the pain of intramuscular vaccine injection (P < 0.05).

Emine Agac and UlkuYapucu Gunes (2010) conducted an experimental randomized controlled trial to determine whether changing the needle before administering an intramuscular injection could reduce pain, and to investigate gender differences in pain perception among 100 patients receiving diclofenac

sodium intramuscularly in an emergency and traffic hospital in Izmir, Turkey. Pain intensity was measured on a numerical rating scale. Each patient received two injections by the same investigator using two different techniques. The two techniques were randomly allocated and the patients were blinded to the injection technique being administered. After each injection, another investigator who had no prior knowledge of which injection technique was used immediately assessed pain intensity using a numerical rating scale. Descriptive statistics, paired t-test and t-test were used to evaluate the data. Findings demonstrated that changing the needle prior to intramuscular injection significantly reduced pain intensity. A statistical difference in pain intensity was observed between the two injection techniques. The results supported the hypothesis that changing the needle prior to administering the medicine significantly reduced pain intensity.

Gideon Sartorins, et. al., (2010) conducted a study to determine pain following depot intramuscular injection of oil vehicle based drugs. This study aimed to determine prospectively the prevalence, determinants, severity and functional consequences of pain during the week after intramuscular injection of 1000mg testosterone undecorated (TU) in a 4ml castor oil vehicle at an academic anthology clinic. The time course and co-variables influencing pain scores were analysed by mixed model analysis of variance. Following 168 injections in 125 men, pain was reported by 80% of men, peaking immediately after injection, reaching only moderate severity, lasting 1- 2 days and returning to baseline by day 4. The pain required little analgesic use and produced minimal interference in daily activities. The time course of pain scores was reproducible in 43 men who underwent two consecutive injections. Pain was more severe in men who had an earlier painful

injection, but less severe in elderly and more obese men. There were negligible differences in post-injection pain experience between experienced nurses administering injections. Deep intramuscular injection Gluteal injection of depot TU in 4ml castor oil was well tolerated and post injection pain was influenced by earlier painful injection experience as well as age and obesity.

Kusumadevi, M.S, et. al., (2003) conducted a comparative study to estimate the perception of intramuscular injection pain in men versus women in Bangalore College and Victoria hospital among 300 subjects in which 140 men and 160 women. The pain was assessed for giving intramuscular injections of multivitamin 3ml in gluteal region using 23 gauze needles and subjective pain was assessed by Visual Analogue Scale. Moderately significant higher pain score was associated with women (1.94±1.10) as compared to men (1.74±1.24) (P =060). The study revealed that the moderately significant higher pain scores are associated with women.

Gagliese and Melzack, (2003) conducted a study to assess age differences in pain intensity and quality. They predicted that in a diverse sample of patients at a pain clinic, there would be no age differences in numeric ratings of pain intensity but the elderly people obtained lower scores in a pain questionnaire compared with younger adults. The older group samples had significantly lower total and sensory scores and choose fewer words to describe their pain than the younger group.

Layla Ozdemir, Mitchell JR, et. al., (2001) conducted a one-group quasi experimental study to assess the perception of pain among 25 patients from a 32 bedded dermatology clinic in Turkey. Data were collected using the "Patient Characteristics Form" and the visual analogue scale (VAS). The mean difference in pain levels according to the VAS in the post injection period was significantly higher with administration of IM methylprednisolone in 10 seconds compared with 30-second administration (VAS 1.9 vs. 1.3; $p < .05$). The severity of pain peaked at 0 minutes for both injection speeds. But the duration of pain was longer with 10-second injections. The data showed that at multiple time points after 10-second injections, men and patients >40 years experienced greater pain severity. Pain severity after 30-second injections was greater for patients of normal or low weight who had completed higher levels of education. In conclusion, slow IM injection of steroids improved pain management.

Mitchell JR, et. al., (2001) The purpose of this study was to examine the effect of varying injection speed on the perception of pain in an industrial area. Fifty workers were given intramuscular hepatitis B vaccine at injection speeds of 10 and 30 seconds per cubic centimetre (s/cc). The perception of pain was measured on a visual analogue scale and reported post-injection at three different time intervals. The results showed that no difference in pain was perceived by participants between the two injection speeds. Results also revealed that women consistently had higher mean pain scores than men and significantly more pain at the 0 hour measurement of the 10 s/cc injection. While the results of this study indicated that no need to administer an intramuscular injection slower than 10 s/cc.

J.M. Johnson Umezulike (1999) conducted, a comparative study to determine the difference and similarities in pain perception among 32 elderly African Americans and 32 elderly Caucasian subjects using Mc Gill Melzack pain questionnaire and a 2 by 2 analysis of variance was done and identified a statistical significant ($f = 6.30$, $df = 1$, $p = 0.015$) difference between the subjects in terms of pain intensity. Pearson's product moment correlation($r = 0.3$, $p = 0.01$)..

Thomas graven (1997) conducted an experimental study to test whether muscle pain was influenced by temporal and spatial summation sequential noxious muscle stimuli applied at hourly inter stimulus-intervals among eleven healthy men. The intensities of local and referred pain were assessed by recordings on visual analogue scales (VAS) and the areas of local pain and referred pain were localised by the subject. Experiment 1: Each subject participated in three tests separated by one week: (a) bolus (0.4 ml saline) infusion at one site; (b) four sequential infusions (0.1 ml saline) given at 90-s inter stimulus-intervals at one site; and (c) four sequential infusions (0.1 ml saline) given at 360-s inter stimulus-intervals at one site. Experiment 2: This was performed as experiment 1, but the infusions were given at spatially separated sites. Experiment 3: Hypertonic saline (0.1 ml) was injected one, four and 24 h after the sequential infusions (90-s inter stimulus-intervals) given at spatially separated sites. The highest VAS peak and the largest local and referred pain areas were found after the bolus infusions. Compared to the first infusion, significant increases were found in the VAS peak, the size of the local pain area, and the size of the referred pain area (non-significant) after the four sequential infusions given at 90-s inter stimulus-intervals (temporal summation). Four spatially separated infusions given simultaneously produced a higher VAS peak, a larger local pain area, and a larger referred pain area (non-significant)

compared to one infusion (spatial summation). The infusion given 4 hours after the sequential infusions tended to produce an increase in the referred pain area and in the pain intensity. In all three experiments significant correlations were found between the VAS peak and the size of the local (R=0.64, P<0.0001, n=231) and referred (R=0.47, P<0.0001, n=231) pain areas. Based on the above results it can be concluded that experimental muscle pain was influenced by temporal and spatial summation. A comparative study was conducted to assess the perception of intramuscular injection pain in men and women among 300 samples. Pain was assessed using visual analogue pain scale. All the data were statistically analysed. Moderately significant higher pain scores was associated with women(1.94±1.10) as compared to men (1.74±1.24)(P=0.060).Statistically significant higher pain scores were observed in women (2.24+±1.19) as compared to men (1.71±1.06) in age group of 21-30 (P=0.036).

2. Literature related to non-pharmacological method for reduction of pain during intra muscular injection:

Kumar VS., Budur, et. al., (2014) conducted a study at Shimoga, Karnataka on 'cough trick' (CT) technique to reduce intramuscular prick (IMP) pain during vaccinations and also for brief painful procedures like subcutaneous injection, intravenous cannulation among 50 patients from four outpatient clinics. The strategy required a single "warm-up" cough of moderate force, followed by a second cough that coincided with needle puncture. The principle outcome was self-reported pain. Paired 't' test revealed that the procedure was effective at a statistically and clinically significant level for participants. The results of this study suggested that the CT can be an effective strategy for the reduction of pain.

A.Farhadi and M.Eshmail Zadhen, (2011) conducted a study in University of Islamic Azad, Iran to determine the effect of local cold (ice application) on severity of pain during intramuscular injection among 60 patients using randomized sampling method. The post-test assessment done by using Visual Analog Scale showed that local cold (ice) application decrease the pain during intramuscular injection when compared with control group without cold application.

Azadeh Kamali and Fathima.L (2010) conducted an experimental - randomized control studyon touch therapy at Bangalore among 60 samples by using probability random sampling identified that the overall mean percentage for control group without touch therapy was 57.4 % and for experimental group with touch therapy and massage was 25.7% ($t= 5.68$, $p < 0.05$) and concluded that touch therapy before and during painful nursing intervention reduced level of pain experienced by the clients.

Sr.Serena, (2010) conducted a study on rhythmic skin tapping to reduce procedural pain during intramuscular injection on 60 adults who received intramuscular injection. Injection Tramadol 50mg or Injection Piroxicam 40mg was given for patients who were selected as samples. Baseline information was collected from structured interview schedule. Each sample given 4 injections was taken as samples. In that 2 injections given by normal standard method and 2 injections by using skin tap technique. Pain assessment was done soon after each injection by using Numerical Rating Scale. The result revealed that the overall mean pain in tensing by using skin tap technique (1.5±1.1) was much lower than the pain level by the usual technique (2.5±1.3).

Chambers CT, et al., (2009) conducted a systematic review to determine the efficacy of various psychological strategies for reducing pain and distress in children during routine immunizations. Twenty RCTs involving 1380 infants and children (1 month to 11 years of age) were included in the systematic review. Breathing exercises were effective in reducing children's self-reported pain (standardized mean difference [SMD], -0.43; 95% CI, -0.76 to -0.09; P = 0.01), observer-rated distress (SMD, -0.40; 95% CI, -0.68 to -0.11; P = 0.007), and nurse-reported distress (SMD, -0.57; 95% CI, -0.98 to -0.17; P = 0.005). Self-reported distress ratings appeared to be lower with breathing exercises, but the difference was not statistically significant. No evidence was found to support suggestion as a psychological intervention for reducing pain associated with paediatric immunization. Child-directed distraction was effective in reducing self-reported pain (SMD, -0.28; 95% CI, -0.54 to -0.03; P = 0.03). Parent-led distraction was effective in reducing observer-rated distress (SMD, -0.50; 95% CI, -0.82 to -0.19; P = 0.002), but not other measures of pain or distress. Nurse-led distraction was effective in reducing distress ratings as assessed by the observer (SMD, -0.40; 95% CI, -0.68 to -0.12; P = 0.005), the parent (SMD, -0.37; 95% CI, -0.66 to -0.07; P = 0.01), and the nurse (SMD, -0.42; 95% CI, -0.70 to -0.14; P = 0.004). Parent coaching was effective in reducing observer-rated distress (SMD, -0.71; 95% CI, -1.02 to -0.39; P < 0.001), but not other measures of pain or distress. Combined cognitive-behavioural interventions were effective in reducing children's self-reported pain (SMD, -0.75; 95% CI, -1.03 to -0.48; P < 0.001), observer-rated distress (SMD, -0.53; 95% CI, -0.83 to -0.23; P < 0.001), and parent-rated distress (SMD, -0.97; 95% CI, -1.37 to -0.57; P < 0.001). The methodological quality of the

included trials was generally poor, with 18 (90%) of the 20 studies rated as having a high risk of bias Evidence suggested that breathing exercises, child-directed distraction, nurse-led distraction, and combined cognitive-behavioural interventions were effective in reducing the pain and distress associated with routine childhood immunizations. Although additional well-designed trials examining psychological interventions were needed, parents and health care professionals should be advised to incorporate psychological interventions to reduce the pain and distress experienced by children during immunization.

Taddio A, et al., (2009) conducted a study to determine the effectiveness of physical interventions and ice application in injection techniques for reducing pain during vaccine injection in children. Nineteen RCTs involving 2814 infants and children (0-18 years of age) were included in the systematic review. One study included children more than sixteen years and adults (n = 150). In 2 trials that used child self-reports of pain during administration of measles-mumps-rubella vaccine (total, 680 children with complete data), the Priorix vaccine caused less pain than the MMR (II) vaccine (standardized mean difference [SMD], -0.66; 95% CI, -0.81 to -0.50; $P < 0.001$). In 3 trials (404 children), the number needed to treat (NNT) with Priorix to prevent 1 child from crying was 3.2 (95% CI, 2.6-4.2). In 4 trials (281 infants and children), sitting children up or having parents hold infants appeared to cause less pain than the supine position, but the difference was not statistically significant.

Jaffrey.A. Klassen, et. al., (2008) conducted a randomized controlled trials to show systematic review of efficacy of music therapy on pain and anxiety of children aged from one month to 18 years of age. Active music therapy which involves music with music therapist and passive music therapy was without music therapist. The result showed that music therapy was effective in reducing anxiety and pain in children also it was considered as adjunctive therapy in clinical situations that reduce pain or anxiety. The effects of music on human emotional and physiological responses and ease the pain and anxiety by moving conscious thought away from the symptoms.

Sr. Serena (2007) conducted a study on rhythmic skin tapping technique to reduce pain during intramuscular injections. One group pre-test post-test design was adopted for this study. A purposive sampling technique guided by inclusion criteria was used to select 60 adult patients from orthopaedic and trauma ward. Data collection tool included Interview schedule for the collection of baseline information, 0-10 numerical pain intensity scale to assess pain level after each injection, a table to record pulse rate the overall mean pain intensity by using skin tap technique was (1.5±1.1). The mean value of pain level was greater in females than in males with both techniques. There was no significant association between pain level and other baseline variables like age, diagnosis, previous hospitalization and education The above observations highlighted the effectiveness of ‘ skin tap technique’ on reduction of procedural pain.

Negin Masoudi Alavi (2007) conducted a crossover single blind study to assess effectiveness of acupressure to reduce pain in intramuscular injection among 64 patients. The patients who were prescribed penicillin for at least two daily doses were included in the study. Each subject received an injection with acupressure applied to one buttock and an injection without acupressure to the other buttock or vice versa. The perception of pain was measured on a visual analogue scale. The mean age was 28 ± 9.9 years old. Fifty patients were injected with penicillin 6.3.3 (78%) and 14 patients received penicillin G plus procaine (22%). The mean score for perceived pain intensity for the acupressure injection was 3 ± 2 and the mean score for the injection without acupressure was 5 ± 2. The result showed that the perceived pain intensity as at average 2.5 lower in the acupressure group comparing to ordinary injection ($P < 0.000$).

Barnhil, B.J, M.S et. al., (2005) conducted a study to decrease the pain of intramuscular injection by using manual pressure among 93 patients who had dorsogluteal intramuscular injection of immunoglobulin at a country health department. Forty eight received the pressure treatment and 45 received a standard injection in which no pressure was applied. Mean pain intensity on a 100mm Visual Analogy Scale adjusted for differences in injection volume was 13.6mm for the experimental group and 21.5mm for the control group (P=0.03).

Chung JW, Ng WM, Wong TK. (2002) conducted an experimental study on the use of manual pressure to reduce pain in intramuscular injections at a Hong Kong University among 74 participants between 18 and 42 years of age (mean age 21 years, 55% women). The left and right arms of the participants (intra subject comparison) were randomised to receive an intramuscular injection of hepatitis A and hepatitis B vaccine with (intervention condition) and without (control

condition) the application of pressure at the injection site. A mechanical pressure detection device was placed between the participant's arm and the investigator's thumb. Manual pressure was applied in a standardised way to the deltoid region of the participant's arm for 10 seconds prior to the delivery of vaccination. The mean pain score was lower among patients who received manual pressure prior to injection. Women scored higher for perceived pain intensity for both the intervention ($p<0.001$) and control conditions ($p<0.001$).

Roberta S. Erickson (2002) conducted an experimental study among 90 patients to study the effectiveness of manual pressure. 45 received a standard injection in which no pressure was applied. Mean pain intensity on a 100-mm visual analogue scale, adjusted for differences in injection volume, was 13.6 mm for the experimental group and 21.5 mm for the control group ($P = 0.03$). The findings suggested that simple manual pressure applied to the site was a useful technique to decrease injection pain.

Appletone. M (2001) conducted an experimental study to assess the effect of needle temperature on pain ratings after injection in the US among eighty participants. Samples received an injection of influenza vaccine in one arm and a saline injection in the other using a cold or room temperature needle in a double blinded fashion. The mean pain score for influenza vaccine with the two injections was cold needle 32.2mm±3.2 and room temperature needle 36.0mm±3.8.For saline injections it was 25.2mm±2.95 and 23.7mm±3.19 for the cold needle and room temperature needle respectively. The study concluded that the use of cold needles may not be worth pursuing for injections with mild pain, but may be worthwhile to explore using more painful injections.

Holbert MD, et. al., (1996) conducted an experimental study among 93 patients at a country health department to assess the effectiveness using pressure to decrease the pain of intramuscular injections. The purpose of this study was to determine whether applying pressure to the site for 10 sec prior to an intramuscular injection reduce pain. Mean pain intensity on a 100-mm visual analogue scale adjusted for differences in injection volume was 13.6 mm for the experimental group and 21.5 mm for the control group (P = 0.03). The findings suggested that simple manual pressure applied to the site was a useful technique to decrease injection pain.

3. Literature related to effectiveness of pin-trick method.

Mohammad-RezaYeganekhah.;Zahra Abedini.; Tahmine Dadkhah Tehrani.(2012) conducted a single-blind randomized clinical trial at Kamkar-Arabnia Hospital. In this Study, 50 women aged from 16 to 60 years who had intramuscular injection of penicillin were randomly assigned to two equal groups. The first group received intramuscular injection using, an oval disc that supports multiple blunt pins and in the control group routine injection was performed. Pain was measured using a visual analogue scale. Data were analyzed by chi-square, Fisher's exact, independent t, Kolmogorov-Smirnov, and Levine tests. The mean pain intensities in experimental and control groups were 27.04±8.6 and 36.6±14.1, respectively. After intramuscular injection, the pain intensity significantly decreased in the experimental group compared to control group ($p<0.006$). There was no significant statistical difference between the two groups in age and BMI. The results of this study showed that pressure on the skin with multiple blunt pins was highly effective in reducing the pain of intramuscular injection.

Romano CL, et. al., (2005) conducted a study to reduce pin-prick pain through the pressure of multiple blunt pins at the injection site. Two-hundred and twelve patients were randomly assigned to 2 groups. The treated group (n= 106) received intramuscular and subcutaneous injections with the application of the blunt pins and the control group (n= 106) with a placebo device. Pain was tested with the visual analogue scale on a 0 (no pain)-10 (maximum pain) scale. After intramuscular injections a significant (P< 0.0001) pain reduction in the treated group compared to placebo was observed: 1.90±1.27 versus 5.16±1.37 (mean pain reduction: 63.2%); 88.5% of the patients in the treated group and 11.4% in placebo group rated the pain as = or < 3. After subcutaneous injections mean reported pain in the treated group compared to placebo was: 0.32±0.51 versus 2.61±0.77 (mean pain reduction: 87.7%) (P< 0.0001); 95.1% of the patients in the treated group and 9.8% in the placebo rated the pain as = or <1. No side effects were observed. Multiple blunt pins pressure on the skin, at the time of intramuscular or subcutaneous injection was able to significantly reduce pin-prick pain.

Jayanthi Rani (2011) conducted a quasi experimental post test design of pin –trick method at Salem to assess the effectiveness of pain during intra muscular injection. Among 60 patients participated (30 as experimental groups and 30 as control group). In post test mean score in experimental group was 1.60±1.09 and in control group the post test mean score was 2.33±1.82. The mean difference was 0.73. The calculated value was 5.21 was greater than the table value 2.05. Hence the research hypothesis H1 was retained. It was evident that pin-trick method was effective in reducing the level of intramuscular injection pain.

Nerva Anestesiol (2005) conducted an experimental study to evaluate the effectiveness of pin trick method on reduction of intramuscular injection among 212 patients at Pini Institute; Milano, Italy. The treated group (n= 106) received intramuscular and subcutaneous injections with the application of the blunt pins and the control group (n= 106) with a placebo device. Pain was tested with the visual analogue scale on a 0 (no pain)-10 (maximum pain) scale. After intramuscular injections a significant (P< 0.0001) pain reduction in the treated group compared to placebo was observed: 1.90+/-1.27 versus 5.16+/-1.37 (mean pain reduction: 63.2%); 88.5% of the patients in the treated group and 11.4% in placebo group rated the pain as = or < 3. After subcutaneous injections mean reported pain in the treated group compared to placebo was: 0.32+/-0.51 versus 2.61+/-0.77 (mean pain reduction: 87.7%) (P< 0.0001); 95.1% of the patients in the treated group and 9.8% in the placebo rated the pain as = or <1. No side effects were observed.

CHAPTER III
RESEARCH METHODOLOGY

Research methodology is the overall plan for addressing the research problem. It covers multiple aspects of the study's structure. It acts as a guide for planning, implementation and analysis of the study.

According to **Polit and Hungler (2004),** methodology refers to ways of obtaining, Organising and analysing data. Methodology decisions depend on the nature of the research question.

This chapter deals with description of the different steps undertaken by the investigator in the study. It includes the research approach, design, settings, variables, population, sample size, sample technique, sample criteria, description of the tool, content validity, reliability, pilot study, ethical consideration, data collection procedure and plan for data analysis.

Research Approach

According to **Polit and Beck (2006),** Research approaches are plans and the procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation.

The research approach adopted for the present study was quantitative evaluative approach.

Research Design

According to **Polit and Beck (2010),** Research design is the overall plan for addressing a research question, including strategies for enhancing the study's integrity.

A Quasi Experimental post test only control group design was used for the study and

GROUP	INTERVENTION	POST TEST
Experimental group	X	O_1
Control group	-	O_2

Keys:

X - Intervention (pin-trick)

O_1 - Post test of experimental group.

O_2 - Post test of control group.

Population

According to **Polit and Beck, (2010)** population is the entire set of individuals or objects having some common characteristics.

The population of the present study were those patients who are receiving intramuscular injection in the outpatient and emergency department.

Setting of the study:

Polit and Hungler, (1999) states that setting is the physical location and condition in which data collection takes place. Setting of the study is the essential constituent to ensure effective planning to conduct a research study.

This study was conducted in the out-patient and emergency department of Kongunad Hospital, Coimbatore. Kongunad Hospital is a 250 bedded multi speciality hospital with 24 hours emergency service and diagnostic facilities. It is situated in the heart of the Coimbatore city. The hospital comprises of 7 floors with all facilities, out-patient department, emergency department, in-patient department, cardiac units, and intensive care unit and operation theatre facilities. The hospital

receives an average of 200-210 patients every day. The average number of patients who are receiving Intramuscular injection in the outpatient department is about 100-150 per day. It provides tertiary health care services to public, who come from various parts of Tamilnadu.

Sampling:

- ✓ **Sample**

The sample of the present study was patients who are receiving intramuscular injection in outpatient and emergency department of Kongunad Hospital, Coimbatore.

- ✓ **Sample Size**

According to **Suresh K Sharma, 2011,** sample size is the number of subjects, events behaviours, or situations that are examined in a study.

The sample size for this study were 120 samples those who were receiving intramuscular injection in outpatient and emergency department. 60 Samples from outpatient department were assigned to experimental group and 60 Samples from emergency department were assigned to control group.

- ✓ **Method of sample selection**

According to **Suresh K Sharma, 2011,** method of sample selection is the strategies used to obtain a sample, including probability and non-probability convenience sampling techniques.

- ✓ **Sampling Technique**

The investigator selected the samples by non-probability convenience sampling technique. This entails the use of most readily available samples, which fulfil the sampling criteria.

Criteria for sample selection

Inclusion criteria:

Male and Female patients aged more than 20 years.

Patients who are willing to participate in the study.

Patients who can understand Tamil or English.

Exclusion criteria:

Patients have Neurological disorder and Leprosy.

Patients who have consumed alcohol.

Research Variables

According to **Suresh K Sharma, (2011),** Research variables are the qualities, properties, or characteristics which are observed or measured in a natural setting without manipulating and establishing cause and effect relationship. In this study,

Independent Variable: Pin trick method.

Dependent variable: Level of pain.

Description of Tool:

The tool consists of two sections a structured interview to assess the demographic data and Numerical pain intensity rating scale, to assess the level of pain.

Section-A:

This section consists of structured interview schedule to assess the demographic data such as age, sex, religion, marital status, body built, body mass index, education, occupation and type of work and clinical related data such as

presence of co - morbid illness, frequency of intramuscular injection, position, site of injection, size of the needle, type and volume of medication during intramuscular injection.

Section-B:

Numerical Pain Intensity rating Scale to assess the level of pain scoring was given as mentioned below.

Level of pain	**Score**
No pain (0)	0
Mild pain (1 – 3)	1
Moderate pain (4 – 6)	2
Severe pain (7 – 9)	3
Worst possible pain (10)	4

Content validity:

Polit and Hungler, (1999) defined content validity as the degree of which the item in an instrument adequately represents the universe of the content.

The Research tool developed by the investigator was sent along with the request letter for validation to five experts of in the field of Medical and Surgical Nursing and one Medical expert. The experts were requested to check for the relevance, sequence and adequacy of language of the tool. The expert's suggestions were incorporated in the tool. Then the tool was finalized and used for the main study.

Reliability of the Tool:

According to **Polit and Hungler, (1999)** reliability refers to the degree of consistency or dependability with which an instrument measures the attribute it is designed to measure.

The reliability of the tool was established by using inter rater method. The reliability was calculated using Karl Pearson coefficient and found to be r = 0.78, which showed that the tool was reliable and considered for proceeding.

Pilot study:

According to **Polit and Hungler, (1999)** pilot study refers to a small scale version or trial run done in preparation for a major study. Pilot study tests the reliability, practicability, appropriateness and feasibility of the study and the tool. Pilot study was done among sixteen patients those who were receiving intramuscular injection in the outpatient department, at Kongunad Hospitals, Coimbatore in the month of July 2014 (21-07-2014to 26-07-2014) after obtaining written permission from the higher authority. The samples were selected by non-probability convenience sampling technique after getting verbal consent. Among 16 patients, 8 samples were considered as experimental group and 8 samples were considered as control group. Samples in experimental group received intramuscular injection by using Pin-trick method while the samples in control group received only routine Intramuscular injection. The level of pain was assessed by Numerical Pain Intensity rating Scale for both groups immediately after the intramuscular injection. The collected data was analysed and tabulated by descriptive and inferential statistics. Reliability found r = 0.78, which showed that the tool was reliable and considered for proceeding.

Ethical consideration:

Due permission was sought from the hospital authority including ethical committee clearance report. Informed verbal consent was obtained from the samples. Assurance was given for the confidentiality of the information given by the samples. No routine care was altered or withheld.

Data Collection Procedure:

The data was collected over a period of four weeks from 01.08.14 to 31.08.14. After obtaining written consent from the concerned authority, Non probability convenience sampling technique was used to draw the samples. 60 samples from outpatient department were considered as experimental group and 60 Samples from emergency department were considered to control group. Samples in experimental group received intramuscular injection by using Pin-trick method while the samples in control group received only routine Intramuscular injection. The level of pain was assessed by Numerical Pain Intensity rating Scale for both groups immediately after the intramuscular injection. The collected data was tabulated and analysed by descriptive and inferential statistics.

Plan for Data Analysis:

- ✓ Data were organized in master sheet.
- ✓ Descriptive statistics (frequency, percentage, mean, median, standard deviation, mean percentage) were used to analyze the demographic variables of the experimental and control group.
- ✓ Unpaired 't' test was used to find out the effectiveness of pin trick method on intra muscular injection.

- ✓ Chi –square test was used to find out the association between the level of pain and their selected demographic variables among experimental and control group.

Summary:

This chapter includes description of research approach, research design, study setting, population, sample and sampling technique, selection criteria, selection and Description of the tool, content validity and reliability, pilot study, data collection procedure and plan for data analysis.

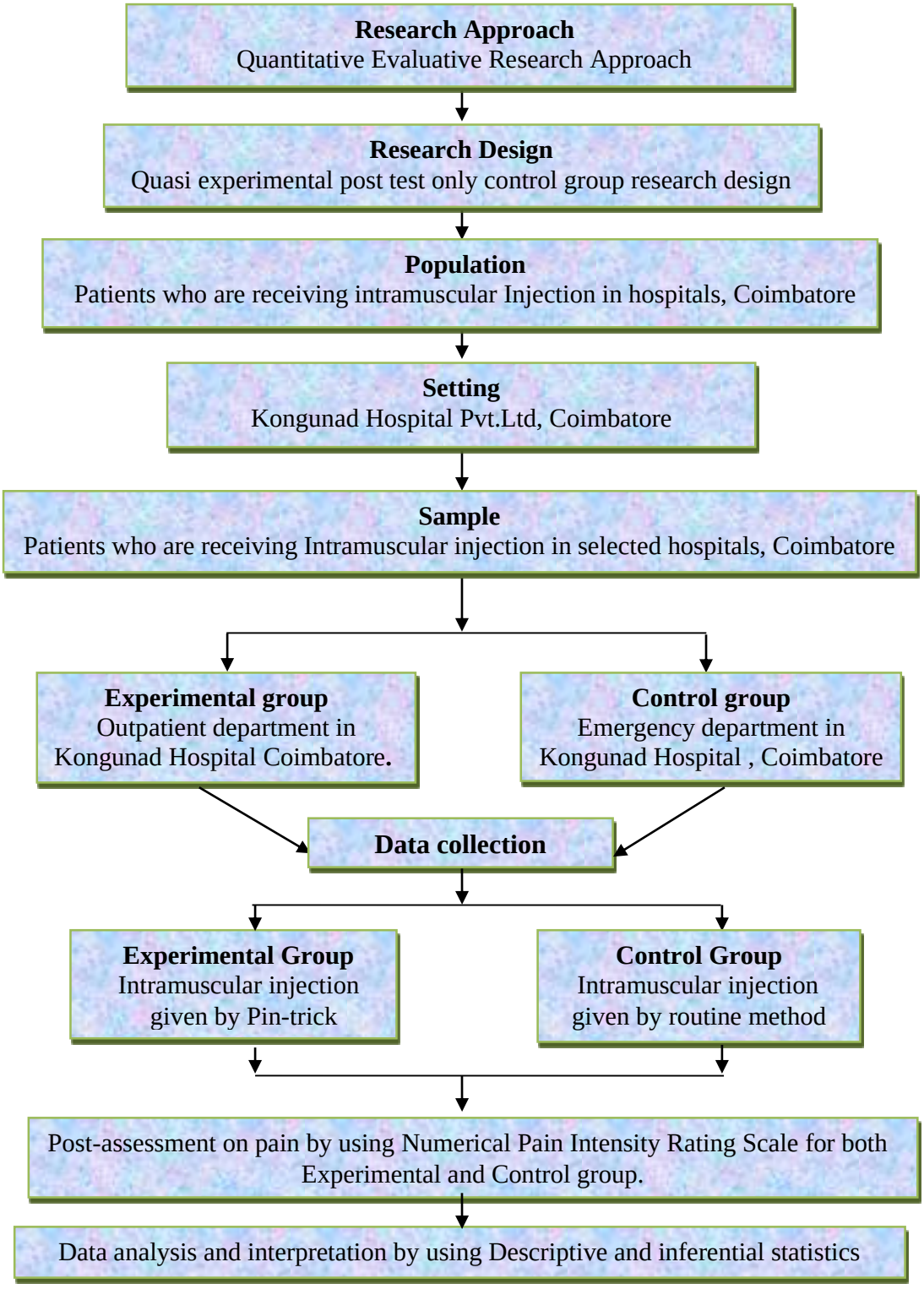

Figure-3.1: Schematic Representation of Research Design.

CHAPTER IV
ANALYSIS AND INTERPRETATION

According to **Polit and Hungler (2006),** analysis is a method of rendering data in quantitative, meaningful and intelligible manner, so that research problem can be studied and tested and the relationship between the variables can be found. This chapter deals with analysis and interpretation of data collected from 120 patients who received intra muscular injection in Kongunad hospitals, Coimbatore in order to assess the effectiveness of Pin –Trick method on Intramuscular injection to reduce the level of pain.

The data collected were analysed using descriptive and inferential statistics which are necessary to provide substantive summary by the results in relation to the objectives.

Objectives

1. To assess the level of pain during intramuscular injection among patients in experimental and control group.
2. To evaluate the effectiveness of pin-trick method on level of pain among patients during intramuscular injection in experimental group.
3. To associate the level of pain among patients receiving intramuscular injection in experimental and control group with their selected demographic variables.

Presentation of Data

The findings of the study were grouped, analysed, organized and presented under the following sections:

Section- A:

Distribution of samples according to their demographic variables among experimental and control group.

Section-B:

Distribution of samples according to their mean post test level of pain among experimental and control group.

Section-C:

Comparison between the mean post test score on level of pain among experimental and control group.

Section-D:

Testing hypotheses

a. Effectiveness of pin trick method on level of pain among experimental group.

b. Association of level of pain during IM injection and their selected demographic variables in experimental and control group.

SECTION – A

Distribution of patients according to their demographic variables in experimental and control group.

Table 4.1 : Frequency and percentage distribution of patients in experimental and control group according to their demographic variables.

n=120

S.No	Demographic variables	Experimental group		Control group	
		f	%	F	%
1.	**Age in years.**				
	• 21-30 years.	10	17%	14	23%
	• 31-40 years.	13	22%	13	22%
	• 41-50 years.	22	37%	16	27%
	• 51-60 years	15	25%	17	28%
2.	**Sex**				
	• Male	27	45%	26	43%
	• Female	33	55%	34	57%
3.	**Religion**				
	• Hindu	54	90%	52	86%
	• Christian.	6	10%	4	7%
	• Muslim.			4	7%
	• Others.			-	-
4.	**Marital status**				
	• Unmarried	13	22%	8	13%
	• Married.	46	77%	52	87%
	• Widow/Widower	1	2%	-	-
	• Divorce.	-		-	-
5.	**Educational status**				
	• Illiterate.	12	20%	10	17%
	• Primary education.	6	10%	9	15%
	• Middle school	12	20%	14	23%
	• Higher secondary.	22	37%	11	18%
	• Graduate.	8	13%	16	27%
6.	**Occupation**				
	• Employed.	35	58%	33	55%
	• Unemployed.	24	40%	24	40%
	• Retired.	1	2%	3	5%
7.	**Working status**				
	• Sedentary worker.	2	3%	2	3%
	• Moderate worker.	17	28%	21	35%
	• Heavy worker	19	32%	13	22%
	• No worker	22	37%	24	40%

8.	**Body build.** • Thin. • Moderate. • Obese.	 7 31 22	 12% 52% 37%	 5 30 25	 8% 50% 42%
9.	**Body mass index** • Morbid > 40 • Obesity 30-34.9 • Overweight 25-29.9 • Normal18.5-24.9 Under weight < 18.5	 2 8 13 30 7	 3% 13% 22% 50% 12%	 1 5 20 33 1	 2% 8% 33% 55% 2%
10.	**Presence of illness.** • Yes. • No.	 33 27	 55% 45%	 19 41	 32% 68%
11.	**Frequency of intramuscular injection.** • Often. • Sometime. • Rarely. • Never before.	 9 15 31 5	 15% 25% 52% 8%	 4 8 47 1	 7% 13% 78% 2%
12.	**Type of medication.** • Oil based. • Water based.	 33 27	 55% 45%	 25 35	 42% 58%
13.	**Site of intra muscular injection.** • Deltoid muscle. • Gluteal muscle.	 2 58	 3% 97%	 4 56	 7% 93%
14.	**Size of the needle.** • 21 Gauge • 22 Gauge • 24 Gauge	 - - 60	 - - 100%	 - - 60	 - - 100%
15.	**Position during intramuscular injection.** • Prone position. • Left lateral position. • Right lateral position. • Sitting position.	 9 26 25 -	 15% 43% 42%	 7 29 22 2	 12% 48% 37% 3%
16.	**Volume of medication** • 5ml • 3ml • 2ml • 1ml	 10 29 10 11	 17% 48% 17% 18%	 5 37 7 11	 8% 62% 12% 18%

Distribution of patients according to their demographic and clinical related variables in experimental and control group

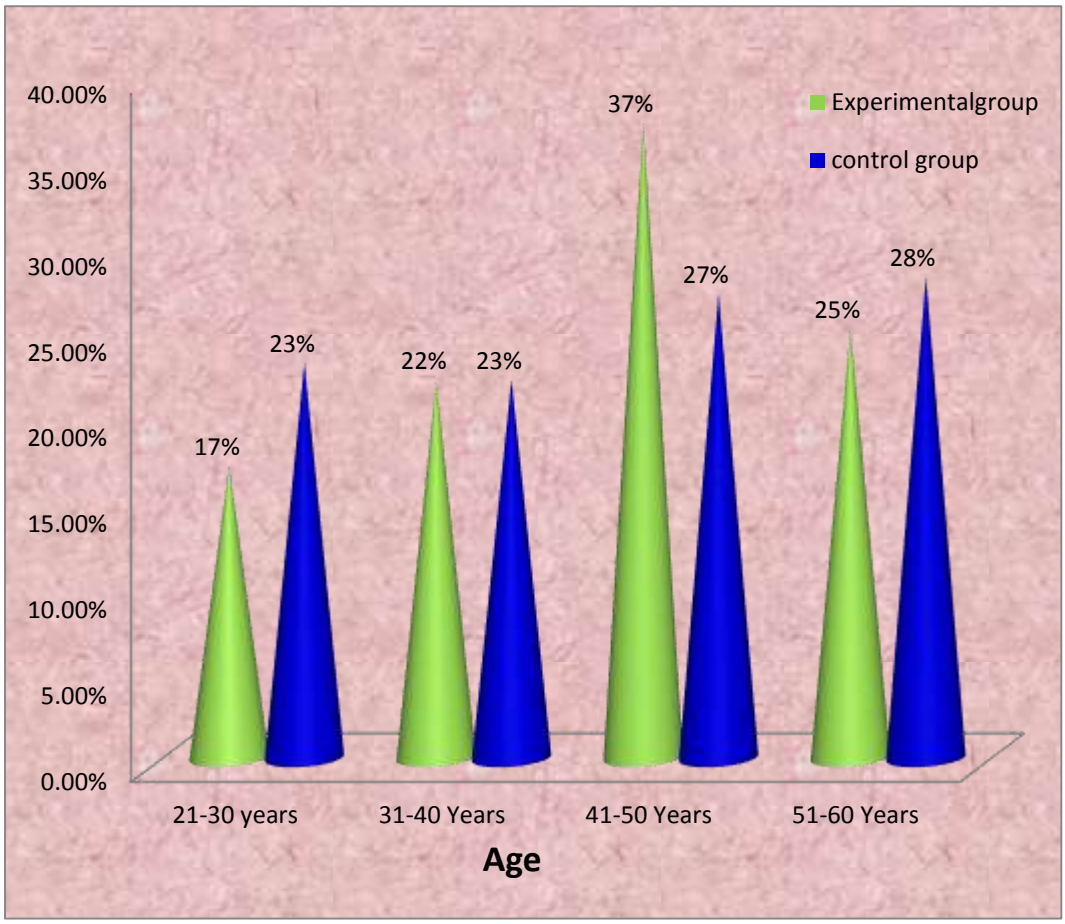

Fig.4.1.1 Percentage distribution of samples according to their age in experimental and control group

The above figure 4.1.1 shows that in experimental group 22 (37%) samples belong to the age group of 41-50years, 15(25%) samples belong to the age group of 51-60 years, 13 (22%) samples belong to the age group of 31-40 years and 10 (17%) samples belong to the age group of 21-30 years.

In control group, 17 (28%) samples belong to the age group of 51-60 years, 16 (27%) samples belong to the age group of 41-50 years, 14(23%) samples belong to the age group of 21-30 years, and 13 (22%) samples belong to the age group of 31-40 years

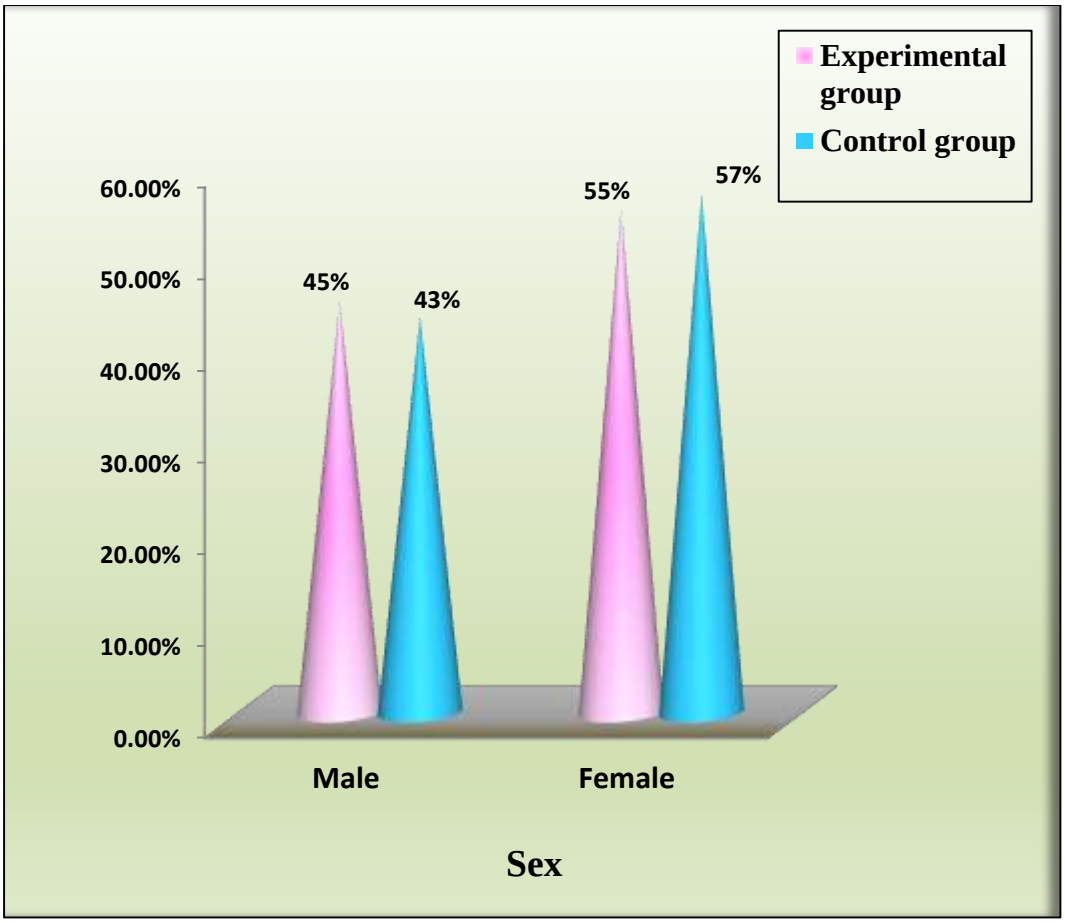

Fig.4.1.2 Percentage distribution of the samples according to their sex in experimental and control group

The above figure 4.1.2 depicts that in experimental group, 33 (55%) of the samples were female and 27 (45%) were male.

In control group, 34 (57%) of the samples were female and 26 (43%) were male.

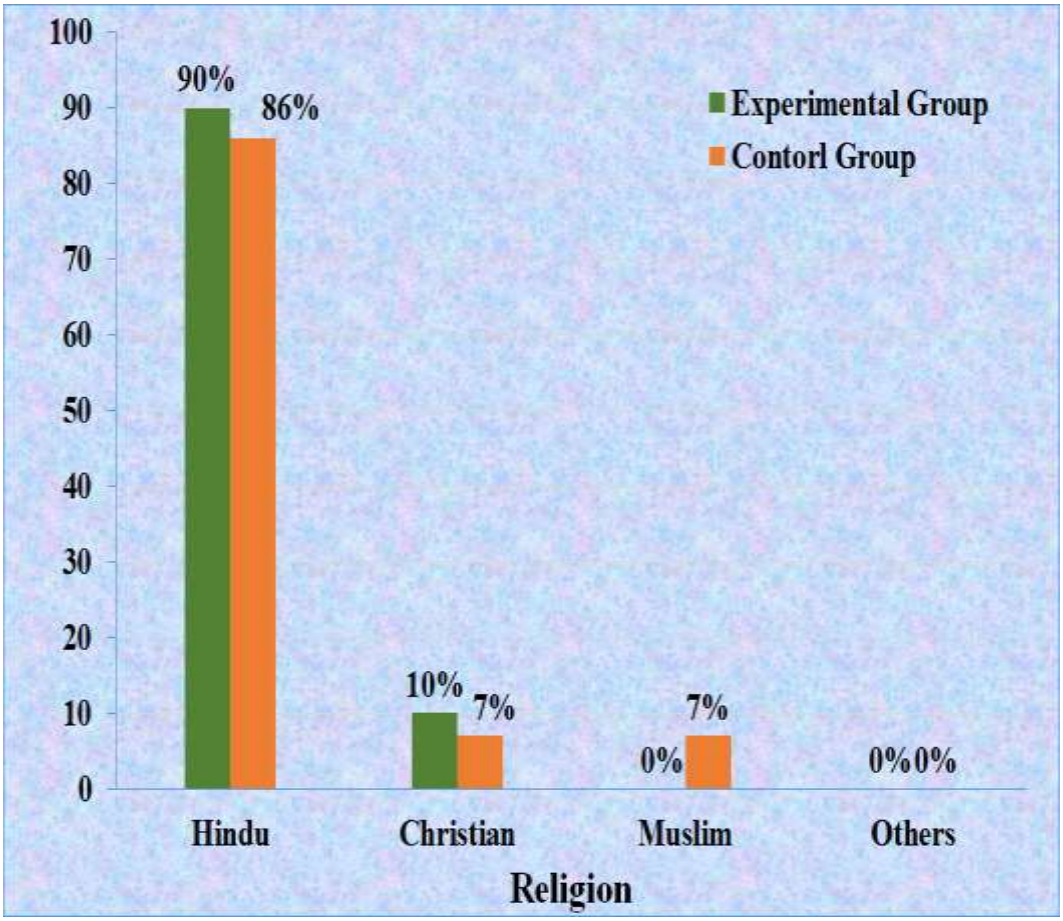

Fig.4.1.3 Percentage distribution of samples according to their religion in experimental and control group

The above figure 4.1.3 portraits that in experimental group, majority of the samples 54 (90%) were Hindus and 6 (10 %) were Christians.

In control group, most of the samples 52 (86%) were Hindus, 4 (7%) were Christians and 4 (7 %) were Muslims.

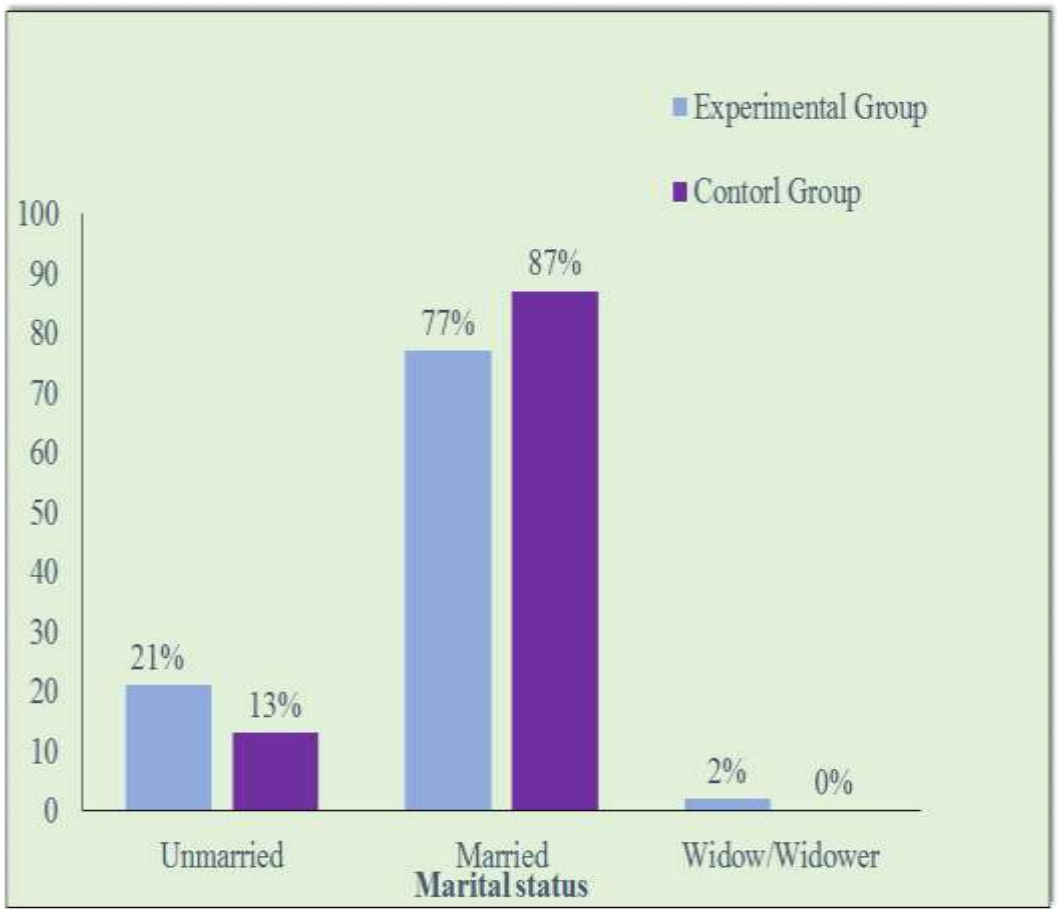

Fig.4.1.4 Percentage distribution of samples according to their marital status in experimental group and control group

The above figure 4.1.4 reveals that in experimental group, 46(77%) were married, 13(21%) were unmarried, 1 (2%) was widow.

In control group, 52 (87%) were married and 8 (13%) were unmarried.

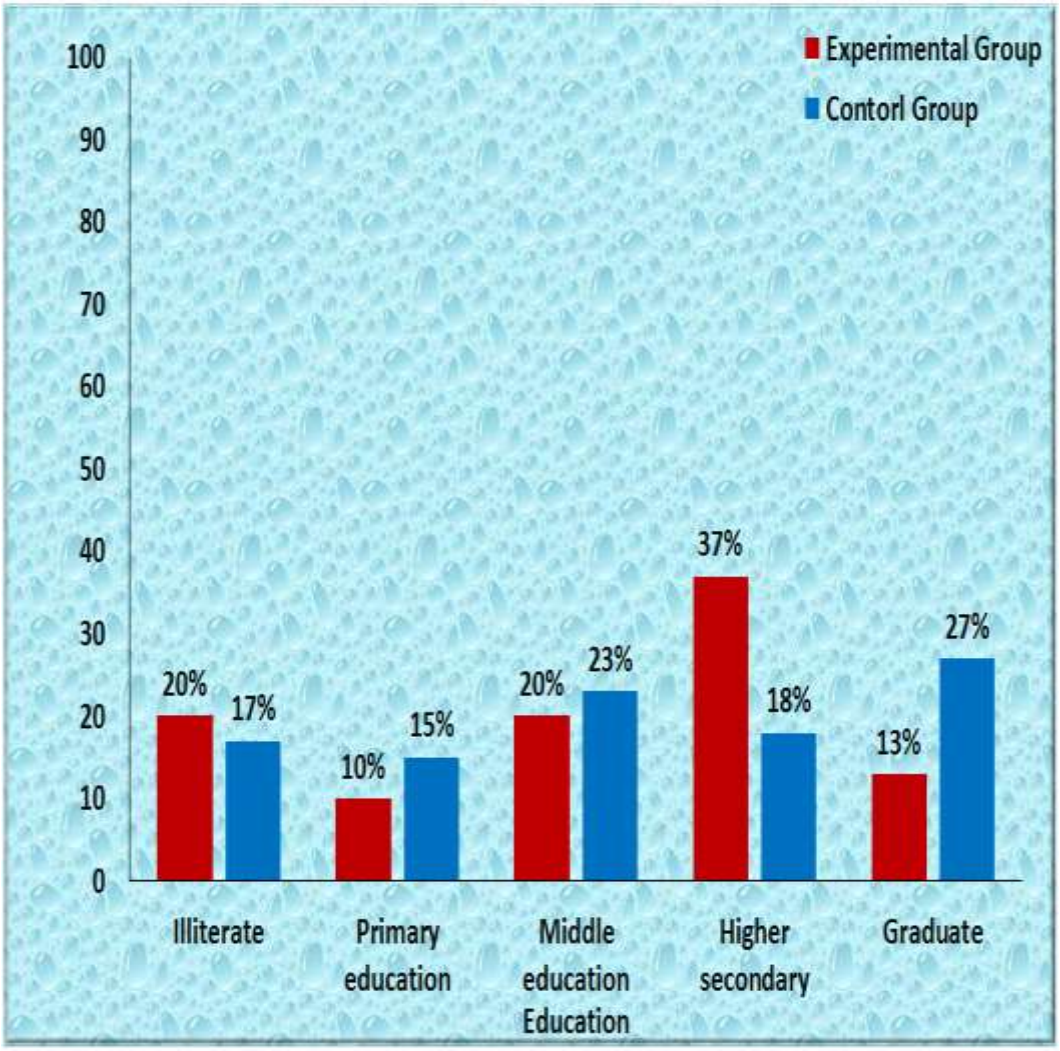

Fig.4.1.5 Percentage distribution of samples according to education in experimental and control group

The above figure 4.1.5 displays that in experimental group, 22(37%) samples had higher secondary education, 12 (20%) were illiterate, 12 (20%)were middle school education, 8 (13%) samples were graduates, and 6 (10%) had primary education.

In control group, samples 16 (27%) were graduates, 14 (23%) completed middle school education, 11 (18%) had higher secondary education, 10 (17%) were illiterate, and 9(15%) had primary education.

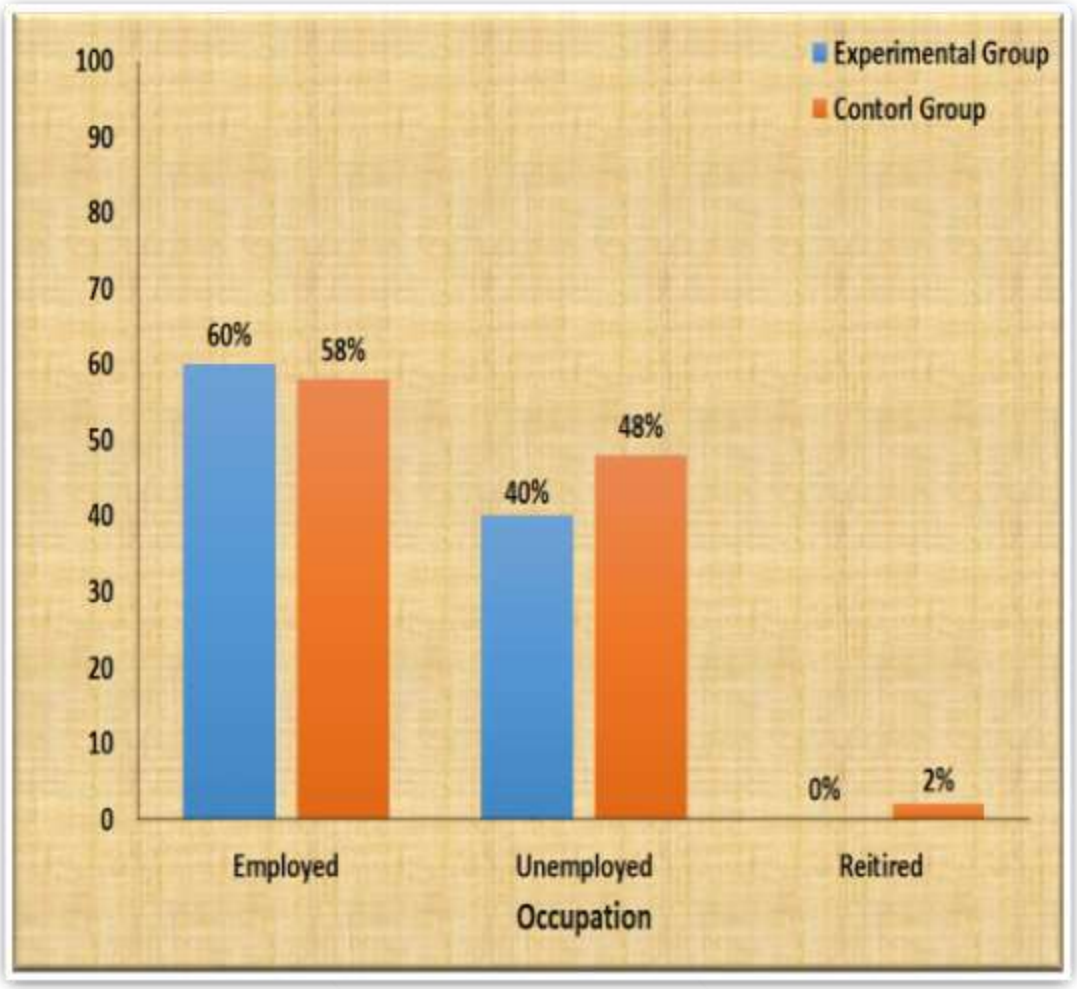

Fig.4.1.6 Percentage distribution of samples according to occupation in experimental and control group

The above figure 4.1.6 shows that, in experimental group, 35 (58%) were employed 24 (40%) were unemployed and 1(2%) were retired samples.7

In control group, 33 (55%) were employed, 24 (40%) were unemployed and 3(5%) were retired.

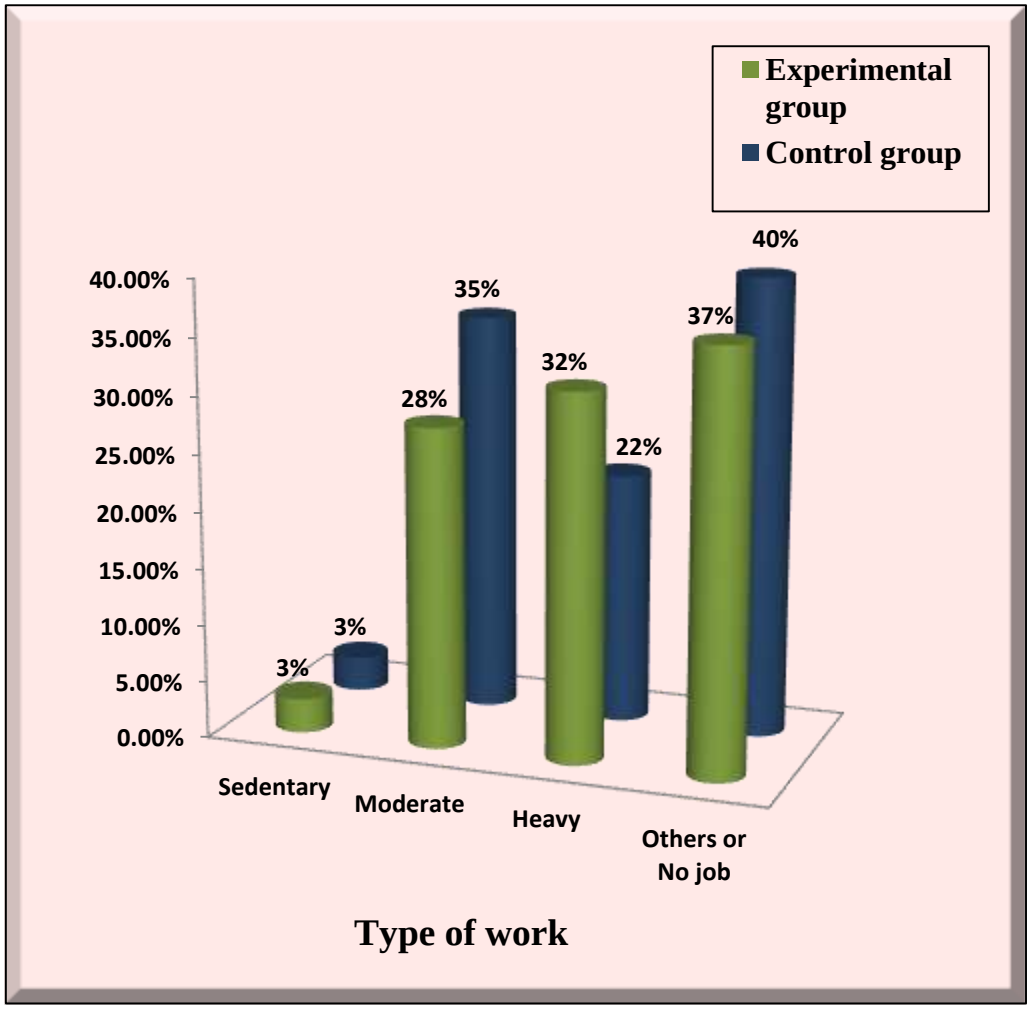

Fig.4.1.7 Percentage distribution of samples according to their type of working in experimental and control group

The above figure 4.1.7 indicates that in experimental group, 22(37%) samples did not do any job, 19 (32%) were heavy workers 17(28%) were moderate workers and 2 (3%) were sedentary workers.

In control group, 24(40%) samples did not do any job, 21 (35%) were moderate workers 13 (22%) were heavy workers and 2 (3%) were sedentary workers.

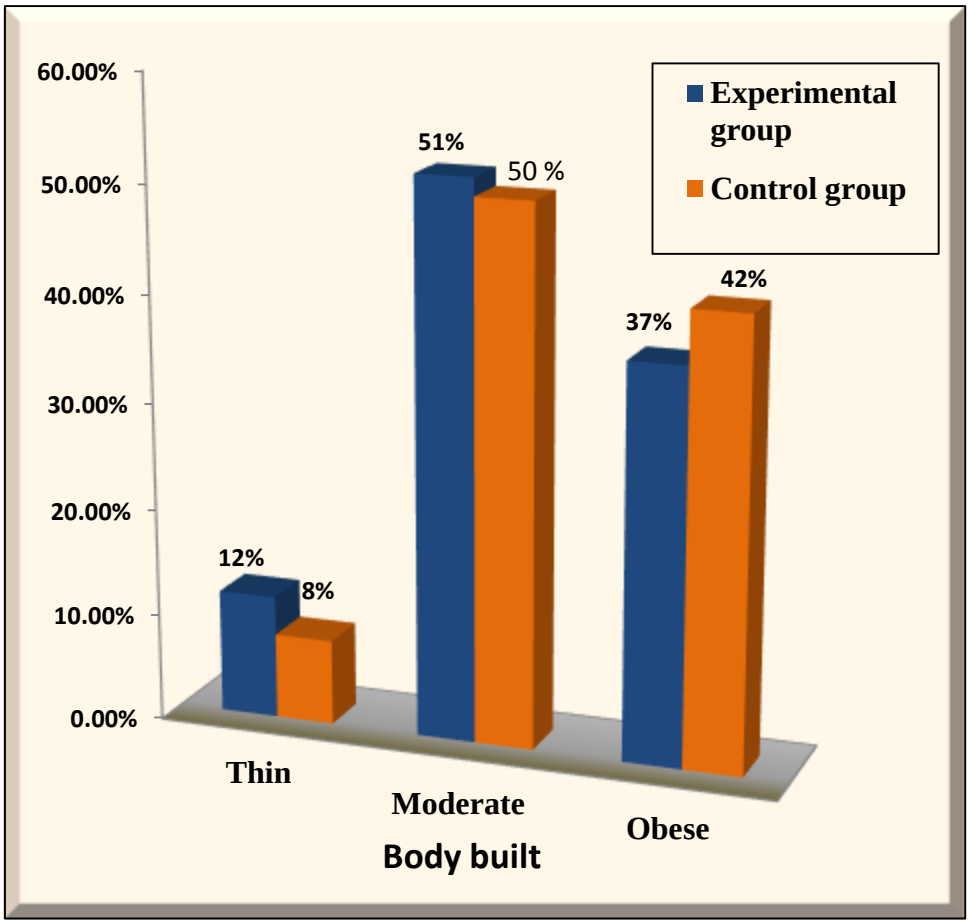

Fig.4.1.8. Percentage distribution of samples according to their body build in experimental and control group

The above figure 4.1.8 depicts that in experimental group, 31 (51 %) samples were moderate built, 22(37%) samples were obese and 7 (12%) samples were thin built.

In Control group, 30 (50%) samples were moderate built, 25 (42%) samples were obese and 5 (8%) samples were thin built.

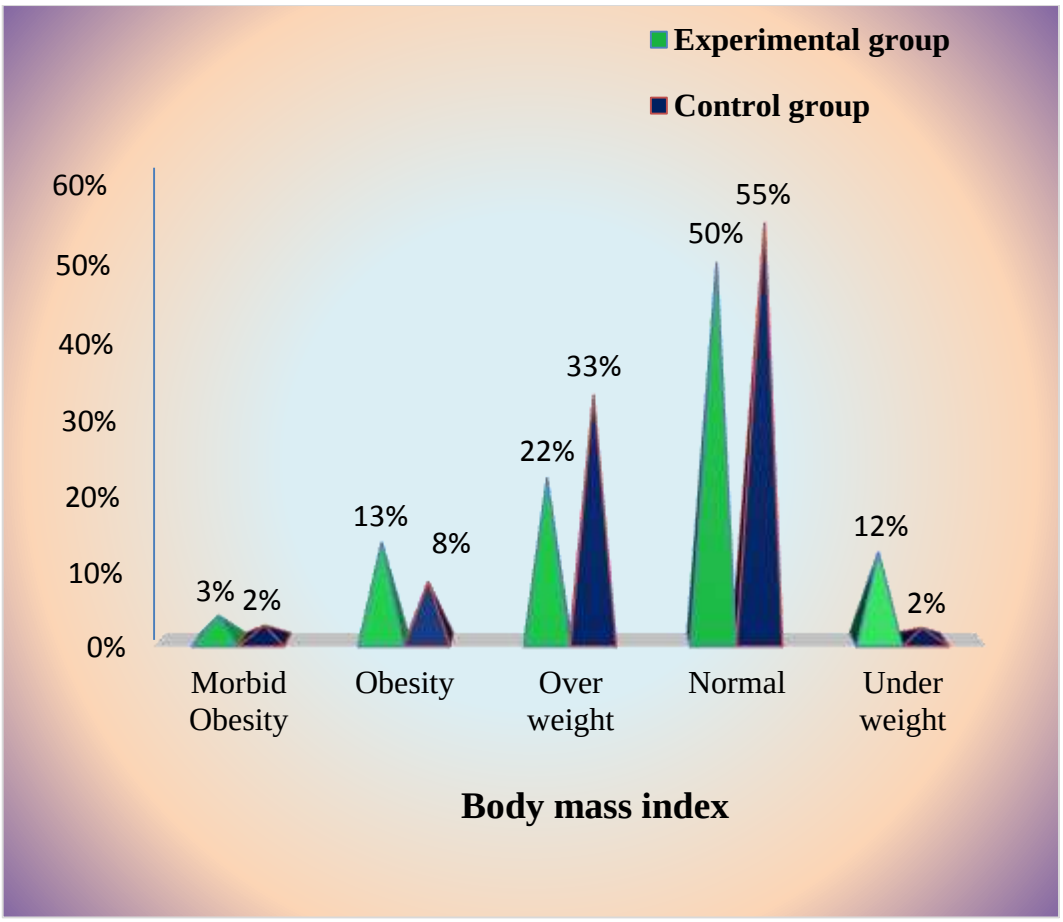

Fig.4.1.9. Percentage distribution of samples according to their body Mass Index in experimental and control group

The above figure 4.1.9 displays that, in experimental group, 30(50%) samples were maintained normal body mass index, 13(22%) had over weight, 8(13%)had obesity, 7 (12%)were under weight, and 2 (3%) were morbid obesity.

In Control group, according to Body mass index, 33(55%) were maintained normal body mass index, 20(33%) had over weight, 5(8%) had obesity, 1 (2%) were under weight, 1(2%) were morbid obesity.

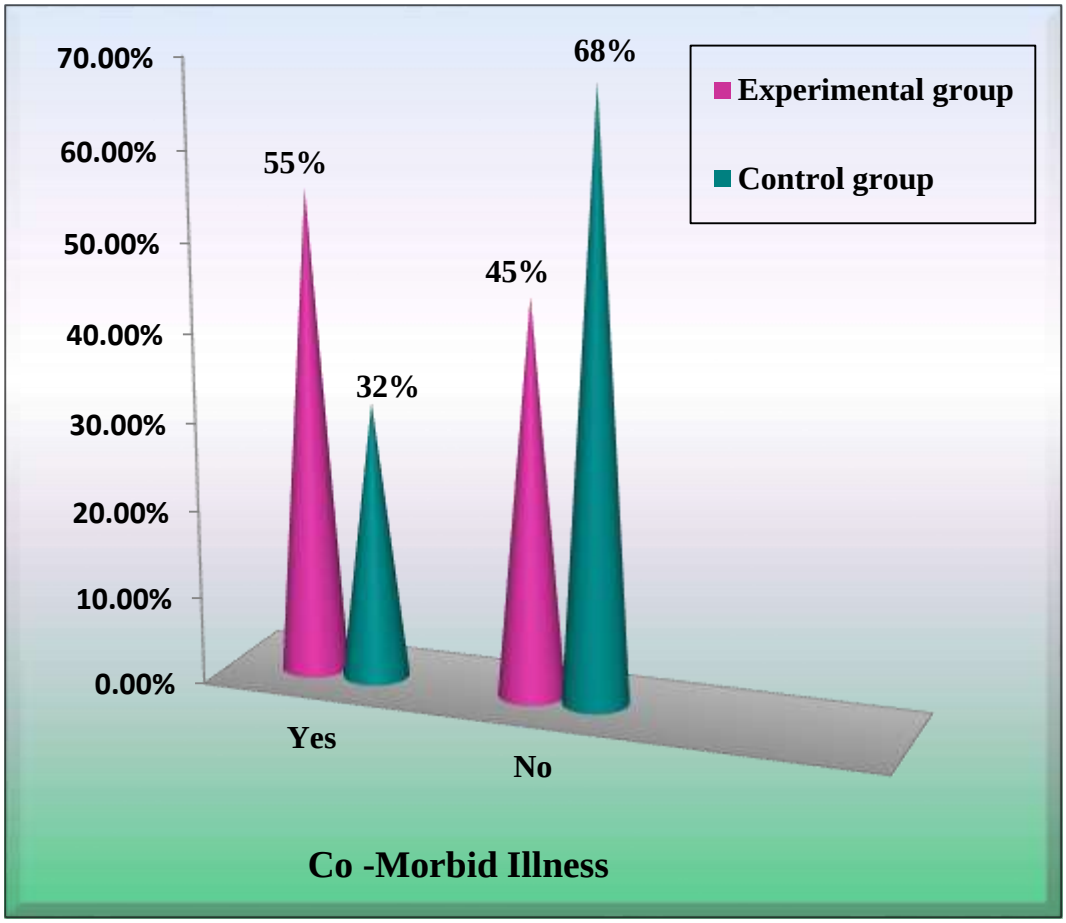

Fig.4.1.10. Percentage distribution of samples according the presence of co-morbid illness in experimental and control group

The above figure 4.1.10 displays that in experimental group, 33 (55%) samples had illness and 27(45%) samples did not have illness.

In control group, 41 (68%) did not have any illness and 19 (32%) had co-morbid illness.

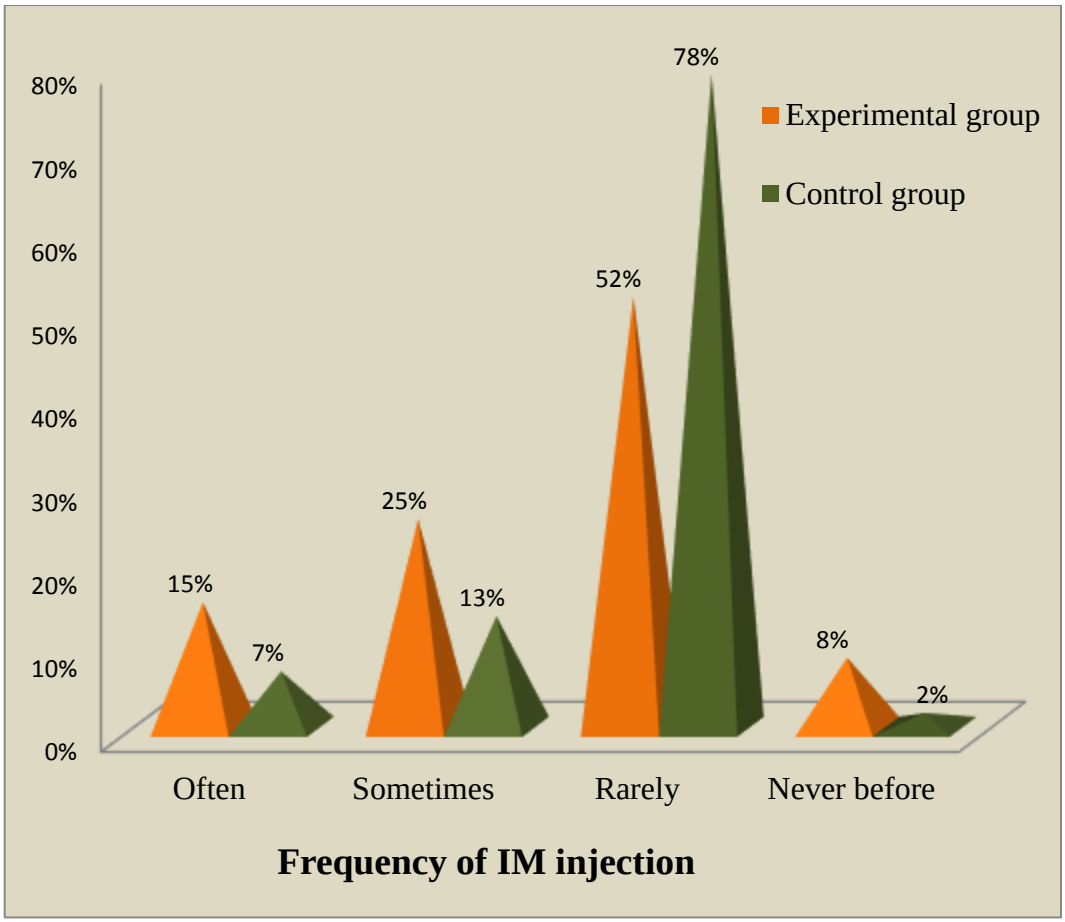

Fig.4.1.11. Percentage distribution of samples according the frequency of intra muscular injection in experimental and control group

The above figure 4.1.11 displays that in experimental group, 31 (52%) samples underwent injection rarely, 15 (25%) samples underwent injection sometimes, 9 (15%) samples underwent injection often, 5(8%) samples had never injected before.

In control group, 47 (78%) samples underwent injection rarely, 8 (13%) samples underwent injection sometimes, 4 (7%) samples had underwent injection often, 1(2%) had never injected before.

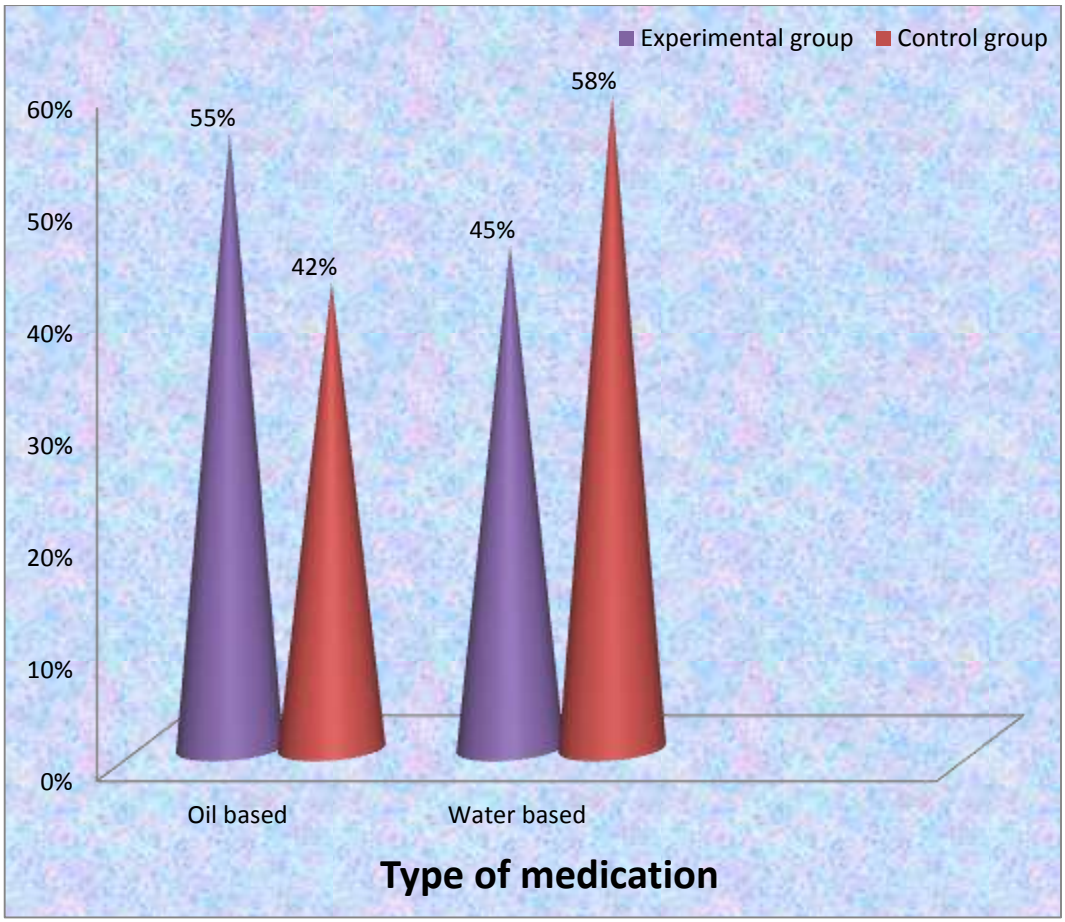

Fig.4.1.12. Percentage distribution of samples according to the type of medication in experimental and control group

The above figure 4.1.12 displays that in experimental group 33 (55%) had oil based injection, 27 (45%) had water based injection.

In control group, according to the type of medication, 35 (58%) have water based injection, 25 (42%) had oil based injection.

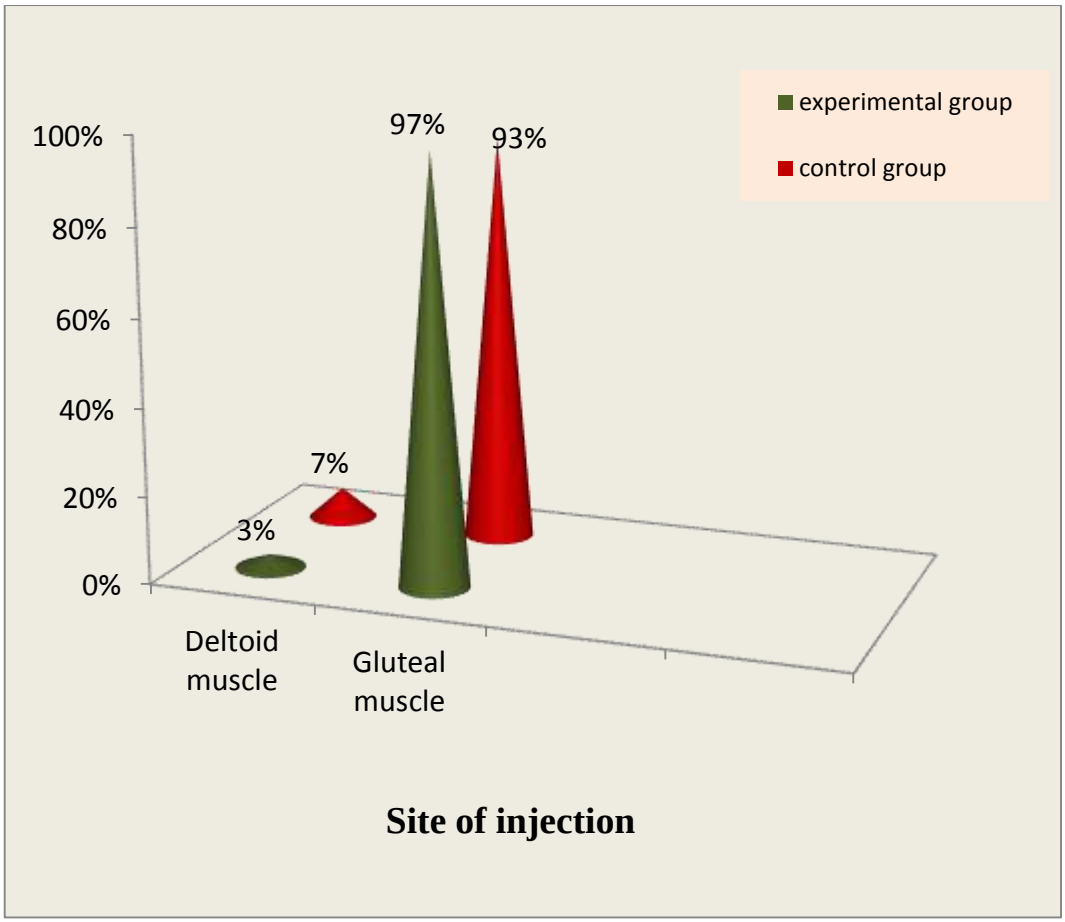

Fig.4.1.13. Percentage distribution of samples according to the site of injection during intramuscular injection in experimental and control group.

The above figure 4.1.13 displays that in experimental group, 58 (97%) samples had injected in Gluteal muscle and 2(3%) had injection in deltoid muscle.

In control group, 56 (93%) had injected in Gluteal muscle and 4(7%) samples had injection in deltoid muscle.

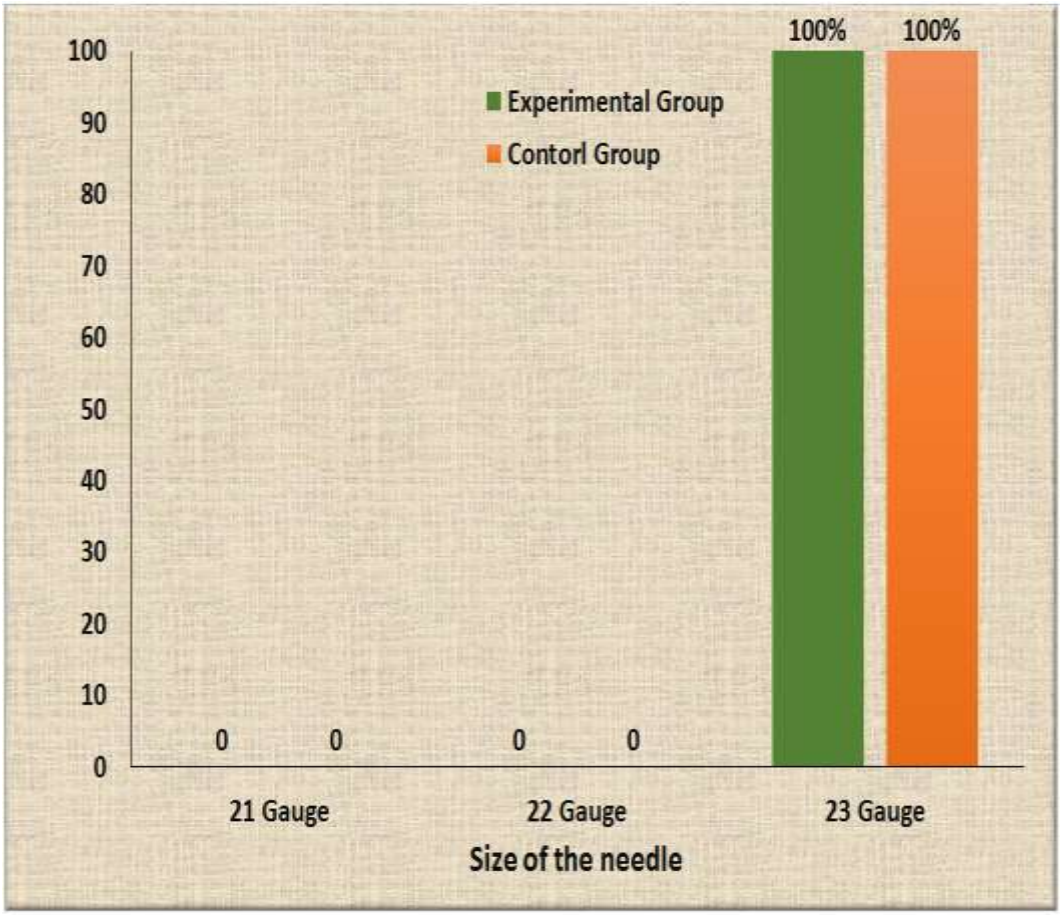

Fig.4.1.14. Percentage distribution of samples according to the size of the needle in experimental and control group

The above figure 4.1.14 displays that in experimental group all the samples 60 (100%) had their injection by 23 Gauge needle, in experimental and control group.

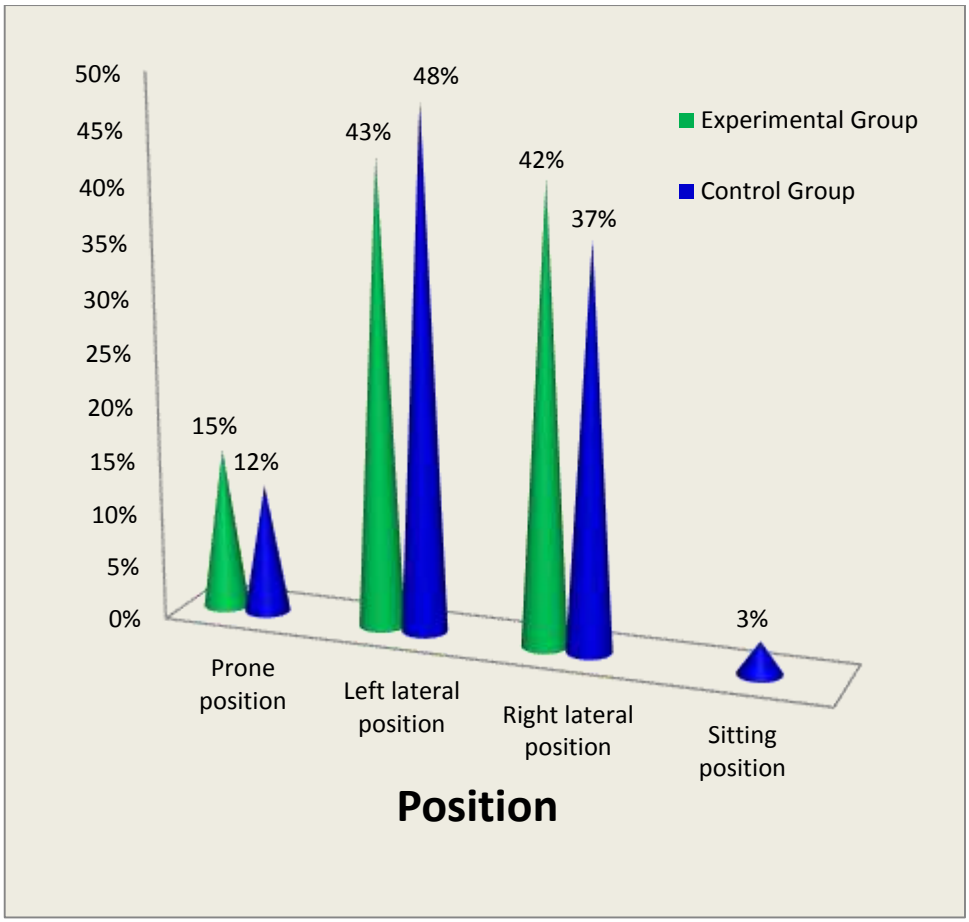

Fig.4.1.15 Percentage distribution of samples according to the position during intramuscular injection in experimental and control group.

The above figure 4.1.15 displays that in experimental group, 26 (43%) samples had maintained left lateral position, 25 (42%) samples had maintained Right lateral position, 9 (15%) had maintained prone position.

In control group, 29 (48%) had maintained left lateral position, 22 (37%) samples had maintained Right lateral position, 7 (12%) samples had maintained prone position and 2(3%) samples had maintained sitting position.

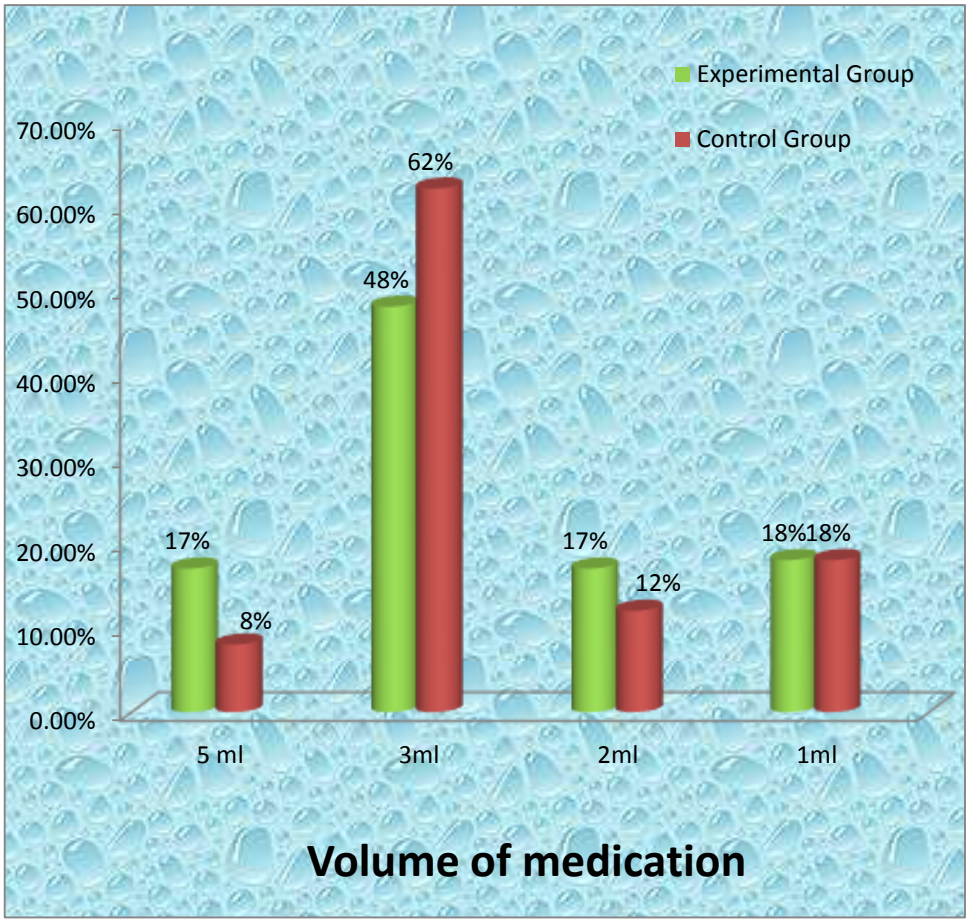

Fig.4.1.16. Percentage distribution of samples according to the volume of the medication in experimental and control group

The above figure 4.1.16 displays that in experimental group, 29(48%) had 3ml of medication, 11(18%) had 1ml of medication, 10(17%) had 5ml of medication, 10(17%) had 2ml of medication.

In control group, the Volume of medication during intramuscular injection, 37(62%) had 3ml of medication, 11(18%) had 1ml of medication, 7(12%) had 2ml of medication, 5(8%) had 5ml of medication.

SECTION - B

Comparison of mean post test score on level of pain among patients in experimental and control group.

Table: 4.2 : Mean Standard deviation and mean difference of post test level of pain among the samples in experimental and control group.

n=120

Group	Post test				Mean difference
	Mean	SD	Maximum score	Mean percentage	
Experimental group	1.62	1.27	10	16.2%	3.01
Control group	4.63	1.16		46.3%	

The above table 4.2 shows that, the post test mean and SD on level of pain among samples in experimental group was 1.62±1.27 and in control group was 4.63±1.16, with a difference of 3.01.

SECTION - C

Testing hypotheses

Effectiveness of pin-trick method on pain among samples

Table 4.3 : Mean, Standard deviation and unpaired 't' value on level of pain among samples.

n=120

Post test group	Mean	SD	Unpaired 't' Value	df
Experimental group	1.62	1.27	**9.75	118
Control group	4.63	1.16		

Table value = 2.35 ****Highly Significant at p≤0.01**

The above table 4.3 portraits the Unpaired 't' test value which was calculated to analyse the effectiveness of pin –trick method on Intramuscular injection to reduce the level of pain among experimental group. The calculated Unpaired 't' value 9.75 was significantly greater than the table value 2.35 at p≤0.01. Hence the hypothesis H_1 was retained. It was evident that pin-trick method was effective in reducing pain among patients receiving intramuscular injection in experimental group.

Association between the level of pain and their selected demographic variables among experimental and control group.

Table 4.4 Chi-square test on level of pain among patients in experimental and control group with their selected demographic variables.

n=120

S.No	Demographic variables	Experimental group n=60			Control group n=60		
		df	**χ^2**	**Table value**	**df**	**χ^2**	**Table value**
1.	**Age**	**6**	***13.36**	**12.59**	6	3.25	12.59
2.	Sex	2	1.41	5.99	2	4.02	5.9
3.	Religion	3	0.33	7.8	4	7.19	9.49
4.	**Marital status**	**4**	***16.63**	**9.49**	2	4.28	5.99
5.	Education	8	4.97	13.36	8	5.87	13.36
6.	Occupation	4	3.31	9.49	4	4.258	9.49
7.	Type of work	6	9.23	12.59	6	2.19	12.59
8.	Body build	4	5.54	9.49	4	0.71	9.49
9.	**Body mass index**	**8**	***20.52**	**13.36**	8	7.14	13.36
10.	Co-Morbid illness	2	0.0729	5.9	2	2.49	5.99
11	Frequency of IM Injection	6	7.27	12.59	6	2.72	12.59
12	Type of Medication	2	1.48	5.9	2	5.23	5.99
13.	Site of IM Injection	2	0.828	5.9	2	1.19	5.99
14.	Position during IM Injection	4	2.14	9.49	6	3.92	12.59
15.	Volume of the medication	6	3.24	12.59	6	3.45	12.59

***Significant p≤0.05**

The table 4.4 displays that in the experimental group there was a significant association found between the level of pain and the demographic variables such as age, marital status, and BMI. Whereas all the other variables such as sex, religion, education, occupation, working status, body built, co-morbid illness, frequency of intra muscular injection, type of medication, Site of intramuscular injection, Position during intra muscular injection, and Volume of medication were not associated. Hence, the hypothesis H_2 is retained for age, marital status, and BMI and rejected for the other variables in experimental group. In control group, none of the variables were associated with the level of pain. Hence, the hypothesis H_2 retained in experimental group and rejected in control group.

Summary

This chapter dealt with data analysis and interpretation in the form of statistical values based on objectives. The Unpaired 't' test was used to evaluate the effectiveness of pin-trick method on intramuscular injection pain. The chi-square analysis was used to find out the association between the level of intramuscular injection pain and their selected demographic variables.

CHAPTER V
DISCUSSION

The study focused on evaluating the effectiveness of pin- trick method on pain during intramuscular injection among patients in the outpatient department at Kongunad Hospital, Coimbatore. This chapter presents the main findings and its discussion.

DEMOGRAPHIC CHARACTERISTICS OF SAMPLES IN EXPERIMENTAL AND CONTROL GROUP

Demographic variables:

This study shows that in experimental group 22 (37%) samples belong to the age group of 41-50years, 15(25%) samples belong to the age group of 51-60 years, 13 (22%) samples belong to the age group of 31-40 years and 10 (17%) samples belong to the age group of 21-30 years. In control group, 17 (28%) samples belong to the age group of 51-60 years, 16 (27%) samples belong to the age group of 41-50 years, 14(23%) samples belong to the age group of 21-30 years, and 13 (22%) samples belong to the age group of 31-40 years.

In experimental group, according to sex, 33 (55%) of the samples were female and 27 (45%) were male. In control group, 34 (57%) of the samples were female and 26 (43%) were male.

In experimental group, according to religion, majority of the samples 54 (90%) were Hindus and 6 (10 %) were Christians. In control group, most of the samples 52 (86%) were Hindus, 4 (7%) were Christians and 4 (7 %) were Muslims In experimental group, according to marital status, 46(77%) were married, 13(21%) were unmarried, 1 (2%) was widow. In control group, 52 (87%) were married and 8 (13%) were unmarried.

In experimental group, according to education, 22(37%) samples had higher secondary education, 12 (20%) were illiterate, 12 (20%) were middle school education, 8 (13%) samples were graduates and 6 (10%) had primary education. In control group, samples 16 (27%) were graduates, 14 (23%) completed middle school education, 11 (18%) had higher secondary education, 10 (17%) were illiterate, and 9(15%) had primary education.

In experimental group, according to occupation, 35 (58%) were employed 24 (40%) were unemployed and 1(2%) were retired samples. In control group, 33 (55%) were employed, 24 (40%) were unemployed and 3(5%) were retired.

In experimental group, according to type of work, 22(37%) samples did not do any job, 19 (32%) were heavy workers 17(28%) were moderate workers and 2 (3%) were sedentary workers. In control group, 24(40%) samples did not do any job, 21 (35%) were moderate workers 13 (22%) were heavy workers and 2 (3%) were sedentary workers.

In experimental group, according to body built, 31 (51 %) samples were moderate built, 22(37%) samples were obese and 7 (12%) samples were thin built. In Control group, 30 (50%) samples were moderate built, 25 (42%) samples were obese and 5 (8%) samples were thin built.

In experimental group, according to Body mass index, 30(50%) samples were maintained normal body mass index, 13(22%) had over weight, 8(13%) had obesity, 7 (12%) were under weight, and 2 (3%) were morbid obesity. In Control group, according to Body mass index, 33(55%) were maintained normal body mass index, 20(33%) had over weight, 5(8%) had obesity, 1 (2%) were under weight, 1(2%) were morbid obesity.

In experimental group, according to presence of co-morbid illness, 33 (55%) samples had illness and 27(45%) samples did not have illness. In control group, 41 (68%) did not have any illness and 19 (32%) had co-morbid illness.

In experimental group, according to the frequency of intra muscular injection, 31 (52%) samples underwent injection rarely, 15 (25%) samples underwent injection sometimes, 9 (15%) samples underwent injection often, 5(8%) samples had never injected before. In control group, 47 (78%) samples underwent injection rarely, 8 (13%) samples underwent injection sometimes, 4 (7%) samples had underwent injection often, 1(2%) had never injected before.

In experimental group according to the type of medication, 33 (55%) had oil based injection, 27 (45%) had water based injection. In control group, according to the type of medication, 35 (58%) have water based injection, 25 (42%) had oil based injection.

In experimental group, 58 (97%) samples had injection in Gluteal muscle and 2(3%) had injection in deltoid muscle. In control group, 56 (93%) had injection in Gluteal muscle and 4(7%) samples had injection in deltoid muscle.

In experimental group according to the size of the needle, all the samples 60 (100%) had their injection by 23 Gauge needle, in experimental and control group. In experimental group, 26 (43%) samples had maintained left lateral position, 25 (42%) samples had maintained Right lateral position, 9 (15%) had maintained prone position. In control group, 29 (48%) had maintained left lateral position, 22 (37%) samples had maintained Right lateral position, 7 (12%) samples had maintained prone position and 2(3%) samples had maintained sitting position.

In experimental group, according to the volume of medication during intramuscular injection, 29(48%) had 3ml of medication, 11(18%) had 1ml of medication, 10(17%) had 5ml of medication, 10(17%) had 2ml of medication. In control group, the Volume of medication during intramuscular injection, 37(62%) had 3ml of medication, 11(18%) had 1ml of medication, 7(12%) had 2ml of medication and 5(8%) had 5ml of medication.

The first objective was to assess the level of pain during intramuscular injection among patients in experimental & control group.

In experimental group, 6(10%) samples had moderate pain, 43(71.67%) of them had mild pain and 11(18.33%) of them had no pain. In control group 4(6.67%) of them had severe pain, 47(78.33%) of them had moderate pain and 9(15%) of them had mild pain.

A.Farhadi and M.Eshmail Zadhen, (2011) conducted a study in University of Islamic Azad, Iran. The aim of the study was to determine the effect of local cold (ice application) on severity of pain during intramuscular injection. 60 patients were selected by using randomized sampling method. In that 30 samples in experimental group received intramuscular injection after local (ice application) application in the injection site and 30 in control group received intramuscular injection without ice application. The post-test assessment was done by using Visual Analogue Scale and it showed that local cold (ice) application decrease the pain during intramuscular injection when compared with control group without cold application**.**

The second objective was to evaluate the effectiveness of pin-trick method on level of pain among patients during intramuscular injection in experimental group.

In post test mean score in experimental group was 1.62±1.27 and in control group the post-test mean score was 4.63±1.16. The mean difference was 3.01. The calculated Unpaired 't' value 9.75 was significantly greater than the table value 2.35 at $p \leq 0.01$. Hence the research hypothesis H_1 was retained. It was evident that pin-trick method was effective in reducing the level of pain among patients receiving intramuscular injection.

The third objective was to associate the level of pain among patients receiving intramuscular injection in experimental and control group with their selected demographic variables.

Significant association found between the level of pain and the demographic variables such as age, marital status, and BMI. Whereas all the other variables such as sex, religion, education, occupation, working status, body built, co-morbid illness, frequency of intra muscular injection, type of medication, Site of intramuscular injection, Position during intra muscular injection, and Volume of medication were not associated. Hence, the hypothesis H_2 is retained for age, marital status, and BMI and rejected for the other variables in experimental group. Hence, the hypothesis is rejected in control group.

Taverner.T, (2005) conducted a study on perception of pain in older people. He believes that older people feel less pain than younger people and older people themselves can assume that aging is associated with both a loss of ability to perceive pain and an increase in non-specific pain related suffering. This can lead to inadequate pain management for older people. This study concluded that the intensity of the individual pain may be lesser which could be due to the fact that older people's ability to describe their pain is impaired.

Summary

This chapter dealt with the discussion of the study with reference to the objectives and supportive studies. All the three objectives have been obtained and the hypothesis were tested and proved.

CHAPTER VI
SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter deals with the summary of the study and conclusions drawn. It also clarifies the implications for different areas like nursing practice, nursing education, nursing research, nursing administrations and recommendations for further research.

SUMMARY OF THE STUDY:

A study was conducted to evaluate the effectiveness of Pin-trick method on Pain during intramuscular injection among patients in the outpatient department at Kongunad hospitals, Coimbatore. A quantitative evaluative approach with quasi experimental post test only control group design was used, through non-probability Convenience Sampling Technique. 120 samples were selected. Among them 60 samples from Outpatient department were assigned to experimental group and 60 samples from emergency department were assigned to control group. The conceptual frame work selected for this study was based on Von Bertanlanffy general system theory.

Demographic variables were collected by using a Structured Interview schedule. In experimental group, investigator used pin-trick device during intra muscular injection and assessed the level of pain by using numerical pain intensity rating scale. In control group investigator followed regular IM injection without any intervention. The data gathered were analysed by descriptive and inferential statistical method.

The findings revealed that in the experimental group the post test mean, on level of pain among patient receiving intramuscular injection was 1.62±1.27 and in control group it was 4.63±1.16. The mean percentage of experimental group was 16.2 and control group was 46.3. The mean difference was 3.01. It revealed that in experimental group, samples had low level of pain than the control group. Unpaired't' test value 9.75 was greater than the table value 2.35 at $p \leq 0.01$ level and it revealed the effectiveness of pin–trick method on Intramuscular injection on the level of pain among experimental group. Hence the hypothesis H_1 was retained. It was evident that pin-trick method was effective in reducing pain among patients receiving intramuscular injection in experimental group.

In the experimental group there was a significant association found between age, marital status and BMI and their level of pain. Hence, the hypothesis H_2 was accepted for the above mentioned variables. Whereas all the other variables such as sex, religion, education, occupation, working status, body built, co-morbid illness, frequency of intra muscular injection, type of medication, site of intramuscular injection, position during intra muscular injection, and volume of medication were not associated. Hence, the hypothesis H_2 was rejected for the above mentioned variables. In control group, none of the variables were associated with the level of pain. Hence, the hypothesis H_2 was accepted. So Pin-trick method is one of the effective methods to reduce the level of pain during IM injection.

Findings of the Study:

The major findings of the study were summarized as below:

This study shows that in experimental group 22 (37%) samples belong to the age group of 41-50years, 15(25%) samples belong to the age group of 51-60 years, 13 (22%) samples belong to the age group of 31-40 years and 10 (17%) samples belong to the age group of 21-30 years. In control group, 17 (28%) samples belong to the age group of 51-60 years, 16 (27%) samples belong to the age group of 41-50 years, 14(23%) samples belong to the age group of 21-30 years, and 13 (22%) samples belong to the age group of 31-40 years.

In experimental group, according to sex, 33 (55%) of the samples were female and 27 (45%) were male. In control group, 34 (57%) of the samples were female and 26 (43%) were male.

In experimental group, according to religion, majority of the samples 54 (90%) were Hindus and 6 (10 %) were Christians. In control group, most of the samples 52 (86%) were Hindus, 4 (7%) were Christians and 4 (7 %) were Muslims In experimental group, according to marital status, 46(77%) were married, 13(21%) were unmarried, 1 (2%) was widow. In control group, 52 (87%) were married and 8 (13%) were unmarried.

In experimental group, according to education, 22(37%) samples had higher secondary education, 12 (20%) were illiterate, 12 (20%) were middle school education, 8 (13%) samples were graduates and 6 (10%) had primary education. In control group, samples 16 (27%) were graduates, 14 (23%) completed middle school education, 11 (18%) had higher secondary education, 10 (17%) were illiterate, and 9(15%) had primary education.

In experimental group, according to occupation, 35 (58%) were employed 24 (40%) were unemployed and 1(2%) were retired samples. In control group, 33 (55%) were employed, 24 (40%) were unemployed and 3(5%) were retired.

In experimental group, according to type of work, 22(37%) samples did not do any job, 19 (32%) were heavy workers 17(28%) were moderate workers and 2 (3%) were sedentary workers. In control group, 24(40%) samples did not do any job, 21 (35%) were moderate workers 13 (22%) were heavy workers and 2 (3%) were sedentary workers.

In experimental group, according to body built, 31 (51 %) samples were moderate built, 22(37%) samples were obese and 7 (12%) samples were thin built. In Control group, 30 (50%) samples were moderate built, 25 (42%) samples were obese and 5 (8%) samples were thin built.

In experimental group, according to Body mass index, 30(50%) samples were maintained normal body mass index, 13(22%) had over weight, 8(13%) had obesity, 7 (12%) were under weight, and 2 (3%) were morbid obesity. In Control group, according to Body mass index, 33(55%) were maintained normal body mass index, 20(33%) had over weight, 5(8%) had obesity, 1 (2%) were under weight, 1(2%) were morbid obesity.

In experimental group, according to presence of co-morbid illness, 33 (55%) samples had illness and 27(45%) samples did not have illness. In control group, 41 (68%) did not have any illness and 19 (32%) had co-morbid illness.

In experimental group, according to the frequency of intra muscular injection, 31 (52%) samples underwent injection rarely, 15 (25%) samples underwent injection sometimes, 9 (15%) samples underwent injection often, 5(8%)

samples had never injected before. In control group, 47 (78%) samples underwent injection rarely, 8 (13%) samples underwent injection sometimes, 4 (7%) samples had underwent injection often, 1(2%) had never injected before.

In experimental group according to the type of medication, 33 (55%) had oil based injection, 27 (45%) had water based injection. In control group, according to the type of medication, 35 (58%) have water based injection, 25 (42%) had oil based injection.

In experimental group, 58 (97%) samples had injection in Gluteal muscle and 2(3%) had injection in deltoid muscle. In control group, 56 (93%) had injection in Gluteal muscle and 4(7%) samples had injection in deltoid muscle.

In experimental group according to the size of the needle, all the samples 60 (100%) had their injection by 23 Gauge needle, in experimental and control group.

In experimental group, 26 (43%) samples had maintained left lateral position, 25 (42%) samples had maintained Right lateral position, 9 (15%) had maintained prone position. In control group, 29 (48%) had maintained left lateral position, 22 (37%) samples had maintained Right lateral position, 7 (12%) samples had maintained prone position and 2(3%) samples had maintained sitting position.

In experimental group, according to the volume of medication during intramuscular injection, 29(48%) had 3ml of medication, 11(18%) had 1ml of medication, 10(17%) had 5ml of medication, 10(17%) had 2ml of medication. In control group, the Volume of medication during intramuscular injection, 37(62%) had 3ml of medication, 11(18%) had 1ml of medication, 7(12%) had 2ml of medication, 5(8%) had 5ml of medication.

Conclusion

The study was conducted to evaluate the effectiveness of pin-trick method on pain during intramuscular injection among patients in the outpatient department at Kongunad hospitals, Coimbatore. The result of this study showed that the pin-trick method was effective in reduction of pain among patients receiving intramuscular injection in experimental group. There was significant association found between the level of pain in age, marital status, and Body mass index in experimental group.

Implications

The findings of the study have the following implications in the various areas of Nursing Service, Nursing Education, Nursing Administration and Nursing Research.

Nursing Service:

- The nurse can understand the importance of Pin-trick method in nursing practice to reduce the level of pain in intramuscular injection.
- The nurse's can be provided adequate exposure to the settings where Pin - trick method is effective in managing intramuscular injection pain.

Nursing Education:

- The nurse educator can involve the concept of pin-trick method to reduce the level of pain in nursing profession.
- Nursing curriculum needs to be updated to identify the aspects of nursing care that are lacking to provide supportive education to pin-trick method.
- The nurse educator should provide teaching regarding pin-trick method to bring out innovative and creative ideas to reduce pain pertaining to intramuscular injection.

Nursing Administration:

- Nurse administrators can arrange for training about pin-trick method usage in clinical settings.
- Administrators can initiate health education by utilizing the staff preparing in usage of pin-trick method to reduce pain during intramuscular injection.
- Nurse advisors can organise formal training programme on usage of pin-trick method and other techniques to reduce pain during intramuscular injection.

Nursing Research:

- More researches can be done to establish effectiveness of pin-trick method.
- Researchers can concentrate on pin-trick method to reduce the level of pain during intramuscular injection.
- Disseminate the findings through conferences, seminar, and publications in professional, national and international journals.
- The generalization of study result can be made by further replication of the study.
- As per the study a nursing care guide can be developed for future references.

Recommendations

- A similar study can be conducted with large group.
- A similar study can be conducted in various settings to identify the factors influence pain during intramuscular injection.
- A similar study can be done with adjunctive therapy.
- A comparative study can be done to determine the effectiveness of pin-trick method versus diversional technique/non-pharmacologic method.

- A comparative study can be done to determine the effectiveness of pin-trick method versus tactile or other cutaneous stimulation method.
- A comparative study can be done to determine the effectiveness of pin-trick method versus sensory stimulation method.

Summary

This chapter dealt with summary, conclusion, implications for nursing practice and recommendation.

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ANEXURE - A

LETTER SEEKING PERMISSION TO CONDUCT THE STUDY

From

Geetha Chitra.J
M.Sc. (N) Final Year,
Kongunadu College Of Nursing,
Coimbatore.

To

The Managing Director,
Kongunad hospitals,
Coimbatore.

Respected Sir/Madam,

Sub: Letter seeking permission to conduct the study.

I, Ms. Geetha Chitra. J, final year M.sc (Nursing) Student of Kongunadu College of Nursing is conducting research project in partial fulfilment of the Tamil Nadu Dr.M.G.R. Medical University, Chennai, as a part of the requirement for the award of M.sc (Nursing) Degree.

TOPIC: "A study to assess the effectiveness of pin –trick method on pain during IM injection among patients in the outpatient department at Kongunad hospitals, Coimbatore"

I request you to kindly do the needful.

Thanking you,

Yours faithfully,

(Geetha Chitra.J)

Place: Coimbatore

Date:

ANNEXURE-B

LETTER GRANTING PERMISSION TO CONDUCT THE STUDY

From,

The Managing Director,
Kongunad Hospitals Pvt .Ltd,
Coimbatore.

Sub: Permission to conduct the study in Kongunad Hospitals Pvt Ltd, Coimbatore.

With reference to the letter, it has been formed that , Ms. Geetha Chitra. J, final year M.sc Nursing student of Kongunadu College of Nursing is allowed to conduct the below topic **"A study to assess the effectiveness of pin –trick method on pain during IM injection among patients in the outpatient department at Kongunad hospitals, Coimbatore".**" in our hospital. In this regard the samples of our hospital have been directed to provide full help and co-operation in facilitating the study.

With Thanks,

Yours faithfully,

The Managing Director,
Kongunad Hospitals Pvt .Ltd,
Coimbatore.

Place: Coimbatore

Date:

ANNEXURE - C

LETTER REQUESTING OPINION AND SUGGESTIONS OF EXPERT FOR CONTENT VALIDATION OF THE RESEARCH TOOL

From

Geetha Chitra . J
M.Sc (N) Final year,
Medical & Surgical Nursing Department
Kongunad College of Nursing
Coimbatore, Tamil Nadu.

To

(Through proper channel)
Respected Madam/ Sir,

Subject: Requesting opinion and suggestions of experts for establishing content validity of the tool.

I, **Ms**.**Geethachitra .J** final year M.Sc.(Nursing) student of Kongunad College of Nursing, Coimbatore, have selected the below mentioned statement of the problem for the research study to be submitted to The Tamil Nadu Dr. M.G.R.Medical University, Chennai as partial fulfilment for the award of Master of Science in Nursing.

Topic: "A STUDY TO ASSESS THE EFFCTIVENESS OF PIN – TRICK METHOD ON PAIN DURING IM INJECTION AMONG PATIENTS IN OUT PATIENT DEPARMENT AT KONGUNAD HOSPITALS ,COIMBATORE ."

I request you to kindly validate the tools & content developed for the study and give your expert opinion and suggestions for necessary modifications.
Thanking you,

Yours Sincerely,

Date:
Place: Coimbatore **Geetha Chitra. J**

Enclosed:

1) Certificate of validation
2) Criteria checklist for evaluation of too
3) Tool for collection of data

ANNEXURES -D

LIST OF EXPERTS FOR VALIDATION

1. **Dr.Karthikeyan,MS,**
   General surgeon,
   Kongunad Hospital Pvt.Ltd
   Coimbatore.

2. **Mr. Kuzhanthivel, M.Sc.(N)**
   Professor,
   Medical and Surgical nursing Dept,
   KMCH College of Nursing,
   Coimbatore.

3. **Mrs. Viji, M.Sc.(N)**
   Professor,
   Medical and Surgical nursing Dept,
   KMCH College of Nursing
   Coimbatore.

4. **Mrs. Deepa, M.Sc.(N)**
   Assistant Professor,
   Medical and Surgical nursing Dept,
   Sri Ramakrishna College of Nursing
   Coimbatore.

5. **Mrs. Rajalakshmi, M.Sc.(N)**
   Professor,
   Medical and Surgical nursing Dept,
   PPG College of nursing,
   Coimbatore.

6. **Mrs. Bhavani**, **M.Sc.(N)**
   Professor,
   Medical and Surgical nursing Dept,
   KG College of nursing,
   Coimbatore.

ANNEXURE - E

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms.Geethachitra .J**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled **"A study to assess the effectiveness of Pin –trick method on pain during IM injection among patients in outpatient department at Kongunad hospitals, Coimbatore"**

Signature of the Validator

Name:

Designation:

Date:

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms.Geethachitra .J**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled **"A study to assess the effectiveness of Pin –trick method on pain during IM injection among patients in outpatient department at Kongunad hospitals, Coimbatore"**

P. Kuzhanthaivel

Signature of the Validator

Name: P. KUZHANTHAIVEL

Designation: PROFESSOR

Date: 08.07.2014

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms.Geethachitra .J**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled **"A study to assess the effectiveness of Pin –trick method on pain during IM injection among patients in outpatient department at Kongunad hospitals, Coimbatore"**

Signature of the Validator

Name: Ms. P. Vasu

Designation: Professor, M & S (N).

Date: 8-04-2014.

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms.Geethachitra .J**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled **"A study to assess the effectiveness of Pin –trick method on pain during IM injection among patients in outpatient department at Kongunad hospitals, Coimbatore"**

COLLEGE OF NURSING, SRI RAMAKRISHNA INSTITUTE OF PARAMEDICAL SCIENCES
Education Service: M/s. SNR Sons Charitable Trust
395, Sarojini Naidu Road
Coimbatore-641 044
Tamilnadu.

Signature of the Validator

Name: R. DEEPA

Designation: ASST. PROFESSOR

Date: 14.11.14.

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms.Geethachitra .J**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled **"A study to assess the effectiveness of Pin –trick method on pain during IM injection among patients in outpatient department at Kongunad hospitals, Coimbatore"**

Signature of the Validator

Name: RAJALAKSHMI . B.

Designation: Professor.

Date: 15/4/14.

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms.Geethachitra .J**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled **"A study to assess the effectiveness of Pin –trick method on pain during IM injection among patients in outpatient department at Kongunad hospitals, Coimbatore"**

Signature of the Validator

Name: S. BAVANI

Designation: Assoc Prof

Date: 20/11/14

ANNEXURE – F

TOOL FOR DATA COLLECTION

SECTION – A

DEMOGRAPHIC VARIABLES

1. Age in years

   a) 21 – 30 Years ( )

   b) 31 - 40 Years ( )

   c) 41 – 50 Years ( )

   d) 51 -60 Years ( )

2. Sex

   a) Male ( )

   b) Female ( )

3. Religion

   a) Hindu ( )

   b) Christian ( )

   c) Muslim ( )

   d) Others ( )

4. Marital Status

   a) Single ( )

   b) Married ( )

   c) Widow/Widower ( )

   d) Divorcee ( )

5. Educational status

a) Illiterate ( )

b) Primary education ( )

c) Middle school ( )

d) Higher secondary ( )

e) Graduate ( )

6. Occupation.

a) Employed ( )

b) Unemployed ( )

c) Retired ( )

7. Type of work.

a) Sedentary Worker ( )

b) Moderate Worker ( )

c) Heavy Worker ( )

d) Others ( )

8. Body built

a) Thin ( )

b) Moderate. ( )

c) Obese ( )

9. Body mass index.

a) Morbid Obesity more than 40 ( )

b) Obesity 30 – 34.9. ( )

c) Overweight 25 – 29.9 ( )

d) Normal 18.5 – 24.9. ( )

e) Underweight below18.5 ( )

10. Presence of co – morbid illness.

a) Yes. ( )

b) No ( )

11. Frequency of Intra muscular injection.

a) Often ( )

b) Sometimes ( )

c) Rarely ( )

d) Never before ( )

12. Type of medication

a) Oil based ( )

b) Water based ( )

13. Site of Intra muscular injection.

a) Deltoid muscle ( )

b) Gluteal muscle. ( )

14. Size of the needle.

a) 21Gauge. ( )

b) 22 Gauge. ( )

c) 23 Gauge. ( )

15. Position during Intra muscular Injection.

a) Prone position. ( )

b) Left lateral position. ( )

c) Right lateral position ( )

d) Sitting position ( )

16. Volume of medication injected.

a) 5ml ( )

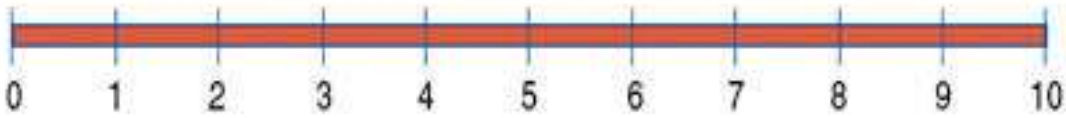
b) 3ml ( )

c) 2ml ( )

d) 1ml ( )

SECTION-B

Kindly specify the range for the numerical pain intensity rating scale.



Scoring	Range
0	No pain
1-3	Mild pain
3-6	Moderate pain
6-9	Severe pain
9-10	Worst possible pain

அடிப்படை விபரங்களை அறியும் நேர்காணல் படிவம்

அன்பார்ந்த பங்கேற்பாளர்களே,

இந்த பகுதி தனிநபர் பற்றி விபரங்களைக் கொண்டுள்ளது. தங்களைப்பற்றிய சரியான விபரங்களை தெரிவிக்க வேண்டுகிறேன். தங்களைப் பற்றிய விபரங்கள் பத்திரமாக பாதுகாக்கப்படும்

பகுதி - அ
கீழ்கண்டவற்றுள் சரியானவற்றை தேர்வு செய்க:

1. வயது
   - அ) 21-30 வயது ( )
   - ஆ) 31-40 வயது ( )
   - இ) 41-50 வயது ( )
   - ஈ) 51-60 வயது ( )

2. பாலினம்
   - அ) ஆண் ( )
   - ஆ) பெண் ( )

3. மதம்
   - அ) இந்து ( )
   - ஆ) கிருஸ்துவர் ( )
   - இ) முஸ்லிம் ( )
   - ஈ) இதர ( )

4. திருமண நிலை
   - அ) திருமணமாகாதவர் ( )
   - ஆ) திருமணமானவர் ( )
   - இ) விதவை/மனைவியை இழந்தவர் ( )
   - ஈ) விவாகரத்து ஆனவர் ( )

5. கல்வி தகுதி
   - அ) படிப்பறிவில்லாதவர் ( )
   - ஆ) துவக்கப்பள்ளி கல்வி ( )
   - இ) நடுநிலைப்பள்ளி கல்வி ( )
   - ஈ) உயர்நிலைப்பள்ளி கல்வி ( )
   - உ) பட்டதாரி ( )

6. தொழில்
   - அ) பணியில் உள்ளவர் ( )
   - ஆ) பணியில் இல்லாதவர் ( )
   - இ) ஓய்வு பெற்றவர் ( )

7. தொழிலின் நிலை
   அ) மிக மதிமான வேலை செய்பவர் ( )
   ஆ) மிதமான வேலை செய்பவர் ( )
   இ) கடினமான வேலை செய்பவர் ( )
   ஈ) இதர ( )

8. உடல் வாகு
   அ) ஒல்லியான உடல் வாகு ( )
   ஆ) மிதமான உடல்வாகு ( )
   இ) பருமனான உடல்வாகு ( )

9. உடல் அடர்வு அலகு
   அ) மிகவும் பருமானவா 40-க்கு மேல் ( )
   ஆ) பருமனானவர்30-34.9 ( )
   இ) எடை மிகுந்து 25-29.9 ( )
   ஈ) சரியான எடை18.5 -24.9 ( )
   உ) மிகவும் ஒல்லியான 18.5 கீழ் ( )

10. வேறு ஏதேனும் நோய் உள்ளதா?
   அ) ஆம் ( )
   ஆ) இல்லை ( )

11. தசையில் ஊசி போடப்படும் தவனை
   அ) அடிக்கடி ( )
   ஆ) சில சமயம் ( )
   இ) எப்போதாவது ( )
   ஈ) இதற்கு முன் இல்லை ( )

12. மருந்தின் தன்மை
   அ) நீர் தன்மை ( )
   ஆ) எண்ணெய் தன்மை ( )

13. உடலில் எந்த பகுதியில் ஊசி போடப்படுகிறது
   அ) கை சதை பகுதி ( )
   ஆ) இடுப்பு சதை பகுதி ( )

14. ஊசியின் அளவு
   அ) 21 G ( )
   ஆ) 22 G ( )
   இ) 23 G ( )

15. ஊசி போடும் போது நோயாளி எந்த நிலையில் இருந்தார்

அ) முகுதுபுறம் மேல் நோக்கி இருத்தல் ( )
ஆ) இடது பக்கமாக படுத்தல் ( )
இ) வலது பக்கமாக படுத்தல் ( )
ஈ) அமர்ந்த நிலை ( )

16. போடப்படும் மருந்தின் கொள்ளளவு

அ) 5 மி.லி ( )
ஆ) 3 மி.லி ( )
இ) 2 மி.லி ( )
ஈ) 1 மி.லி ( )

பகுதி - ஆ

எண்களிலான அளவு கோலைக் கொண்டு வலியின் தன்மையை அளவிடுதல்

குறிப்பு

இப்பிரிவில் எண்களிலான அளவு கோலினை கொண்ட வலியின் தன்மையை அளவிட பயன்படுகிறது

வலியின் அளவினை எண்களின் மூலம் கணக்கிடும் அளவு கோல்

மதிப்பீடு	வரையறை
0	வலியின்மை
1-3	மிக மிதமான வலி
4-6	மிதமான வலி
7-9	அதிகமான வலி
10	கடுமையான வலி

ANNEXURE - G

CERTIFICATE OF EDITING

TO WHOMSOEVER IT MAY CONCERN

Certify that the dissertation paper titled **study to Assess the Effectiveness of Pin -Trick method on Pain during IM Injection among Patients in the Outpatient Department at Kongunad hospital, Coimbatore"** by Ms. Geetha Chitra .J It has been checked for accuracy and correctness of English language used in presenting the paper is lucid, unambiguous free of grammatical or spelling errors and apt for the purpose.

Signature with date

A.ARUL SAHAYARAJ, M.A., B.Ed.,
B.T Asst. in English.
St. Antony's Hr. Sec. School,
Kosavapatty, DINDIGUL - 624 304.

CERTIFICATE OF EDITING

TO WHOMSOEVER IT MAY CONCERN

Certify that the dissertation paper titled **"A study to assess the Effectiveness of Pin -Trick method on Pain during IM Injection among Patients in the Outpatient Department at Kongunad hospital, Coimbatore".** By Ms. Geetha Chitra. J. It has been checked for accuracy and correctness of Tamil language used in presenting the paper is lucid, unambiguous free of grammatical or spelling errors and apt for the purpose.

C.S.I. (CMM) HR. SEC. SCHOOL
Dt. 06.01.2015
UDHAGAMANDALAM - 643 001

BSRT MA.BEd.
06/01/2015.
Signature with date:
TAMIL PANDIT, PG., ASST
C.S.I. (CMM) HR. SEC. SCHOOL,
UDHAGAMANDALAM - 643 001
THE NILGIRIS. S. INDIA.

ANNEXURES -H

ADMINISTRATION OF INTRAMUSCULAR INJECTION USING PIN-TRICK METHOD

Introduction

Intramuscular injection is the favourable route of administering medication for rapid and long lasting action. It is the safest and easiest route of administration of injection. It is administration of medicine with syringe and needle into Gluteal / deltoid muscle.

Pin-trick Method

It is a method of applying pressure at the injection site by a round plastic device with hole in the centre and multiple blunt pins around.

Mechanism of action

The ratio of larger diameter of sensory stimulation to the lesser sensory stimulation will determine pain intensity. The physiological stimulation (sensory) of the injection site by multiple pins will sensitize the neuron in the dorsal horn of spinal cord and cause reduced level of pain at the prick site of intramuscular injection.

Steps of procedure

• Explain the procedure to the patient

• Provide privacy to the patient

• Collect the entire articles required near to the patient.

• Position the patient

• Load the syringe from ampoule / vial

• Clean the injection site with spirit swab to remove the surface bacteria.

• Apply the pin-trick device by thumb and middle finger of left hand, over the Injection site by exposing the cleaned area.

- ✓ Prick the site with needle into the hole by the right hand and hold the hub of the needle by using index finger of left hand. Aspirate and then administer medicine.
- ✓ Remove the syringe and place the cotton swab.
- ✓ Massage the site for quick absorption for 5 to 10 seconds.
- ✓ Assess the level of pain by using Numerical Pain Intensity rating Scale.
- ✓ Dispose of the needle in a puncture proof container and syringe in the Container.
- ✓ Wash hands
- ✓ Document the procedure

ANNEXURE-I

PHOTOS